

# The Metal Worker

A WEEKLY JOURNAL OF THE  
**ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.**

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. XLIX.  
 NUMBER 11.

NEW YORK AND CHICAGO, MARCH 12, 1898.

ONE DOLLAR A YEAR.  
 SINGLE COPIES, 5 CENTS.

## AMERICAN SEAL

STOVE PUTTY.  
 FURNACE CEMENT.  
 ELASTIC OIL  
 ROOFING CEMENT.  
 ROOFING PAINT.

PUT UP ESPECIALLY FOR JOBBING TRADE.  
 WILLIAM CONNORS, Troy, N. Y.

## The "Gorton Side-Feed" Boilers

WILL BURN HARD OR SOFT COAL.

You Want the Best. We Have It.

SEND FOR CATALOGUE AND INVESTIGATE FOR YOURSELF.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

Gray Iron Castings. S. CHENEY & SON,  
 Manlius, N. Y.

## EASTWOOD VALVE.

EASTWOOD WIRE MFG. CO., - Belleville, N. J.

## All The Money You Ever Made

on the sale of an unsatisfactory, unsuitable furnace did not compensate you for the trade you lost by that sale.

The money you make when you sell the Paragon Furnace is partly the fair, legitimate profit on that furnace, and a great deal the profit on other goods that you sell to customers you have sold Paragons to.

You can mortgage future trade with Paragon Furnaces and Excelsior Ranges.

ISAAC A. SHEPPARD & CO., Philadelphia and Baltimore.

APOLLO BEST BLOOM

GALVANIZED IRON

Our galvanized sheets bear this stencil



We make only one quality and use  
 no other brand as a trade mark

Apollo Iron and Steel Company

Vandergrift Building  
 Pittsburgh

## Open Lavatories.

We offer special lines of Lavatories, with Plain or Decorated Bowls, ranging in price from \$10.00 or \$12.00 to many times these sums, and we particularly desire correspondence with buyers who wish a serviceable and modern combination at a reasonable price. Inquiries for any description of Tanners' or Plumbers' Supplies will meet with careful consideration.

E. S. WHEELER & CO.,

256 Water St., New Haven, Conn.

New York Store, 194 Front St.  
 Boston Office, 220 Devonshire St.

**HOUSEHOLD RANGES, HEATERS.** Send for Catalogue.  
 The White-Warner Co.,  
 TAUNTON, MASS.

**WILLIAMS STOVE LINING CO.,**  
 TAUNTON, MASS.,  
 Manufacturers of **FIRE BRICK LININGS.**

**PUMP GOVERNORS,**

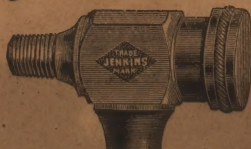
Water Seal Automatic Air Valves, Back Pressure Valves, Pressure Regulating Valves, Radiator Valves, Steam Traps.

JUDSON A. GOODRICH CO.,  
 120 BECKMAN ST., - NEW YORK.

## Steam Specialties.

Pump Governors,  
 Steam Traps,  
 Steam and Water  
 Reducing Valves,  
 Tank Temperature

Noiseless Back  
 Pressure Valves,  
 Water Arches,  
 and Oil Separators,  
 Controller.



## JENKINS AUTOMATIC AIR VALVES

with Drip-pipe Connections insure perfect circulation. You are not annoyed with escaping steam or dripping of water. They are stamped with our Trade-Mark.

JENKINS BROTHERS,

New York, Boston, Chicago, Philadelphia.

## THE MAGEE CATALOGUE

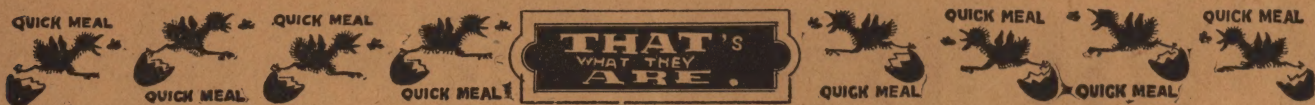
Shows a complete line of cooking and heating apparatus.

SEND FOR A COPY.

MAGEE FURNACE CO., Boston, Mass.

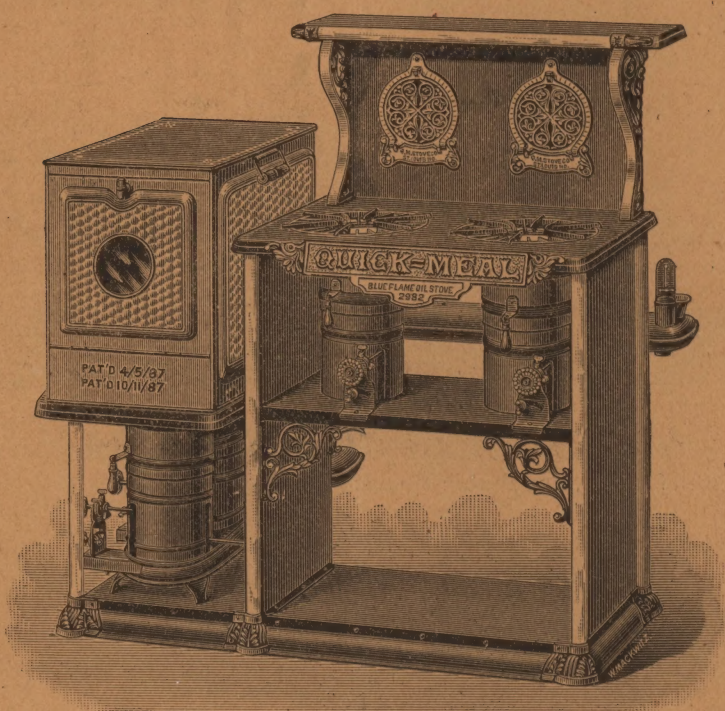
T. KIELEY, 9-17 W. 13th St., NEW YORK.





# QUICK MEAL

## BLUE FLAME OIL STOVES.



The Quick Meal Blue Flame Oil Stove is the youngest member of the Quick Meal family, but it has become just as popular as the Quick Meal Gasoline Stove, the Quick Meal Gas Stove and the Quick Meal Steel Range. Please bear in mind that it has been greatly improved since last year and that it has embodied in it quite a number of points of merit not found in any other Blue Flame Stove—not the least of these being that the Tank is made of two pieces only, jointed with a single seam and leak-proof.

P. S.—Quick Meal Steel Ranges are Great Sellers.

# RINGEN STOVE CO. SAINT LOUIS




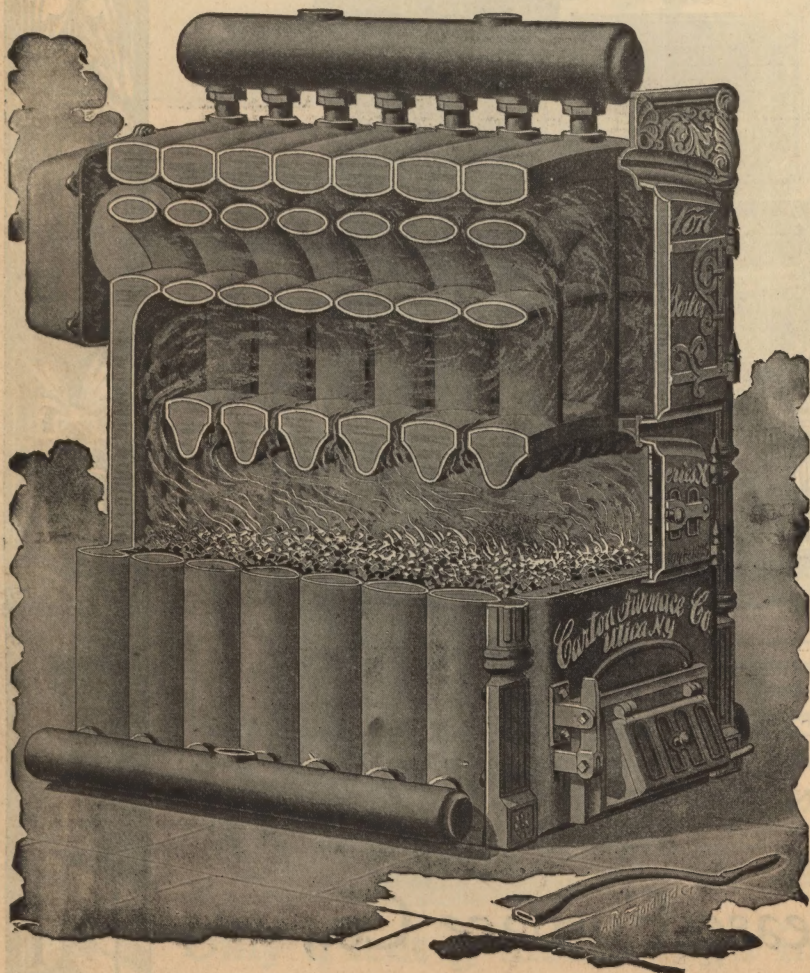
# OUR BOILERS

... GIVE THE ...

## BEST SATISFACTION

With the POOREST QUALITY of  
**SOFT COAL.**

**READ!!!** 



STATE CENTER, IOWA,

Feb. 21, 1898.

CARTON FURNACE CO.,

DEAR SIRs:—We inclose our remittance and wish to express our thanks for getting such *good boilers*.

The writer is using one of them and it is giving *elegant satisfaction* and don't think there is a better boiler made. We are using *a very poor quality of soft coal* and *it works fine*.

Yours truly,

SCHILLING BROS.,

By E. H. SCHILLING.

Write for our Golden Jubilee Boiler  
Catalogue.

If Interested in Hot Air Furnaces—we make a most complete line—send for Furnace Catalogue.

# CARTON FURNACE CO.,

Makers of Heating Apparatus for the past 51 Years,

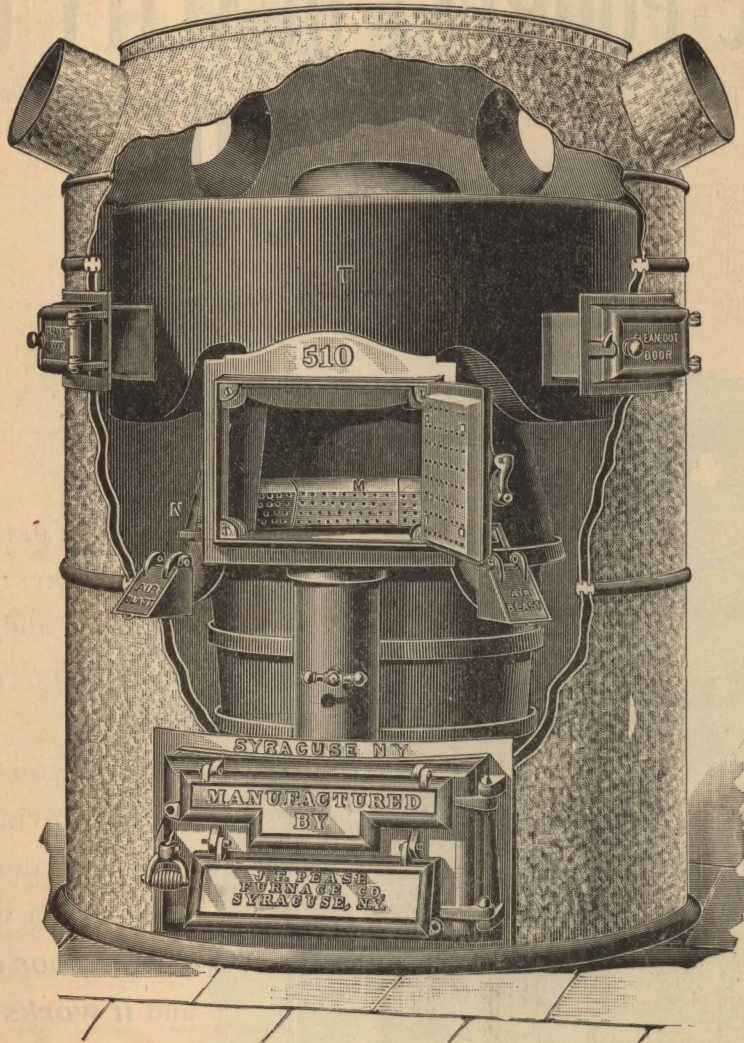
UTICA, N. Y.



J.F. PEASE  
FURNACE CO.

# PEASE Air Blast Furnace

SPECIAL SOFT COAL BURNER.



SPECIFICATIONS—All Cast Iron. Low in Stature. Not High Priced. Special Adjustable Air Blast Appliance. Nearly Jointless Construction. Selection from 3 Styles of Grate. COUNTERBALANCE SPRING REGULATOR.

Catalogues illustrating 13 Patterns of Furnaces promptly mailed to the trade.

## J. F. Pease Furnace Co.,

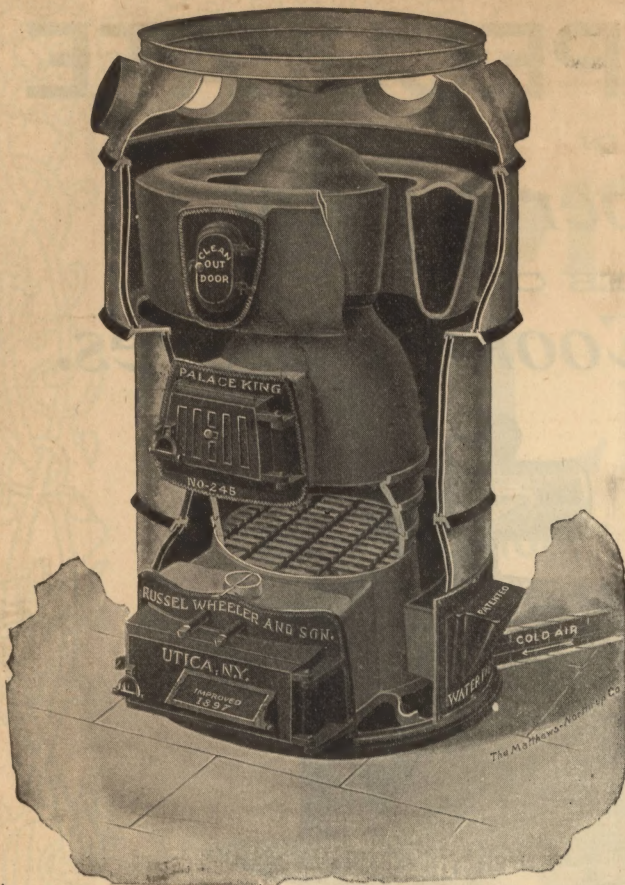
MANFRS. OF  
Furnaces, Combination, Steam  
and Water Heaters.

SYRACUSE, N. Y.

86 East Lake St., Chicago.

SYRACUSE, N.Y.





We have heaters adapted to all sections of the country and for all kinds of fuel—Hard or Soft Coal, Coke or Natural Gas, etc.

Tell us your needs and we will do our best to fit you out.

Only recently a man in the West Indies wanted of us a furnace to burn dried cocoanut husks.

## THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,  
REAL ESTATE,  
HATBORO, PA.

TUESDAY AND FRIDAY,  
221 SOUTH FIFTH STREET,  
PHILADELPHIA.

HATBORO, PA., Dec. 26th, 1896.

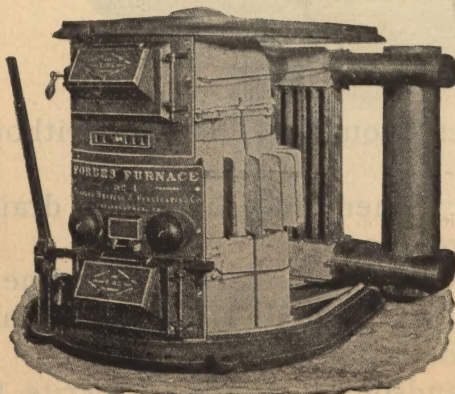
MR. JNO. FORBES,  
Mgt. TUBULAR HEATING AND VENTILATING CO.

MY DEAR SIR:

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal.

Very truly,

I. N. EVANS.



SEND  
FOR  
CATALOGUE

# COLD SMOKE PIPE. HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

Only 4 feet 3 inches high in the Largest Sizes.

... LOW PRICE ...

## TUBULAR HEATING AND VENTILATING COMPANY,

228 QUARRY STREET, PHILADELPHIA.



# DO NOT SPECULATE

IN

*Cheap or Experimental*

LINES OF

*Vapor or Oil Cooking Stoves.*



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

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EXCLUSIVE AGENCIES GIVEN.

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## THE SCHNEIDER & TRENKAMP CO.,

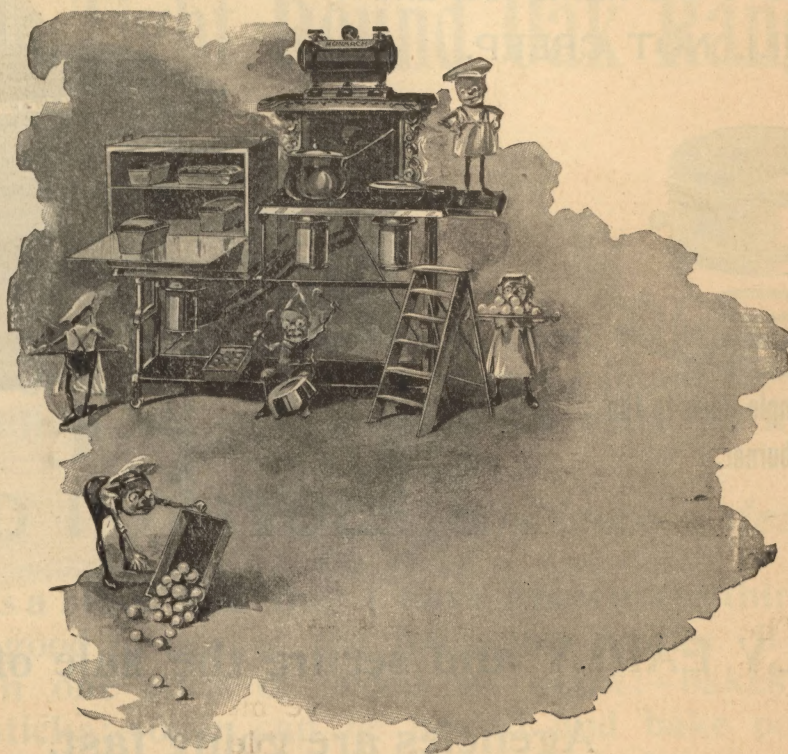
CHICAGO, ILLINOIS.

CLEVELAND, OHIO.



# Monarch Line

**"New Method,"**  
**"Smokeless Giant Generator,"**  
**"Smokeless Safety Junior,"**  
**"Blue Flame Oil,"**  
**"Asbestos Filled Oven."**



**The Monarch Stove and Mfg. Company, Mansfield, Ohio.**

Get our  
**BEAUTIFUL NEW CATALOGUE**  
 and read all about them.

**BRANCH HOUSES:**

67 Lake St., Chicago.  
 284 Pearl St., New York City.  
 107 N. Second St., Philadelphia.  
 954 Penn Ave., Pittsburgh, Pa.  
 191 Eagle St., St. Paul, Minn.  
 12 W. 10th St., Kansas City, Mo.  
 Lincoln, Neb.  
 H. Leonard & Sons, Grand Rapids, Mich.  
 Kiechle, Brentano & Co., Evansville, Ind.



*Have You Secured . . . .*  
*. . . . an Agency*

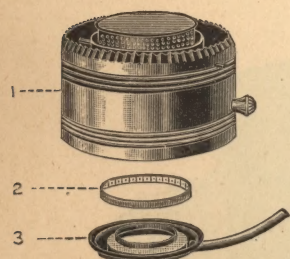
. . . . FOR THE . . . .

# Puritan Wickless BLUE FLAME OIL COOKING STOVE?

The SIMPLEST and Most Perfect in Operation.

BURNS COAL OIL (Kerosene) OR GASOLINE.

You can have the flame low and it  
WILL NOT CREEP.



Only 3 simple parts to the  
burner.



APPLY EARLY and secure the sale of the BEST.

Agencies are going fast.

We have jobbers at all distributing points for convenience in  
making prompt deliveries.

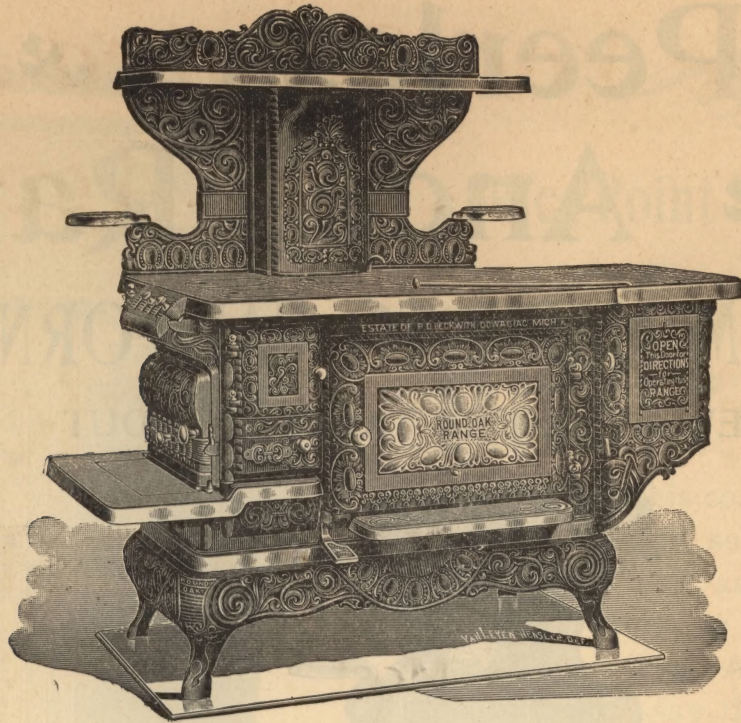
## THE CLEVELAND FOUNDRY CO.,

CLEVELAND.

BOSTON.

SAN FRANCISCO, 132 Market Street.





Fast Growing Famous.

## The Air Tight Round Oak Range!

A POT OF BEANS!

*Read this from a user!*

"We placed a crock of beans in the oven upon retiring at night—put in ONE stick of wood—and in the morning found the beans perfectly baked—and live coals enough to quickly start the fire."

**BAKED POTATOES**—*this from a dealer.*

"There never was a stove sold that I have known anything about—that was half as good in any of the following points: it will keep fire perfectly with one stick of wood all night:—bakes perfectly with two small sticks:—oven can be heated and bake potatoes for breakfast in 30 minutes—and in every way it is far superior to all others. I shall push them another season."

*It is all in the painstaking fitting.*

Do you like to sell the best?

Address for Agency

**Estate of P. D. Beckwith, Dowagiac, Mich.**

Makers of the Highest Class Stoves in America.



# The Peerless Andes Range.

FROM MAINE TO CALIFORNIA

EVERY ONE IS TALKING ABOUT



## THE PEERLESS ANDES RANGE.

BECAUSE of its unequalled qualities for cooking.  
BECAUSE of its peculiar and original construction.  
BECAUSE of its fine finish and artistic design.  
BECAUSE so many have been sold in so short time.  
BECAUSE the people appreciate a good range when they see it.  
BECAUSE the proper time to secure the agency is now.

*ALL STYLES AND SIZES AND FOR ANY KIND OF FUEL.*

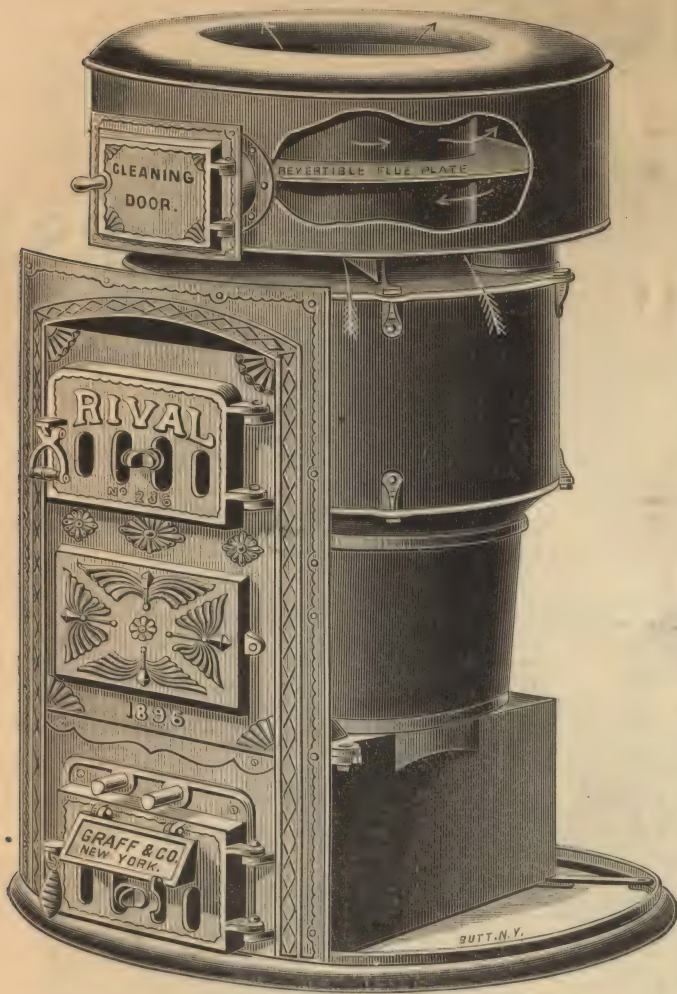
### PHILLIPS & CLARK STOVE CO.,

TROY, N. Y.

GENEVA, N. Y.

CHICAGO, ILL.





We Point With Pride  
to this unrivalled

# Rival Furnace.

Because this construction secures *as much radiating surface, and as great heating capacity, and is as easy to control and keep in order* as any *high-priced* furnace. After two years' use many dealers say they never saw a furnace that could *outheat* it. We can give you *more furnace* at a *low price* than can be found elsewhere. *Try and see!*

**GRAFF & CO.,**

*Manufacturers,*

208 Water Street, - New York.

# P RANGES

# A Are Best

# C BECAUSE

They're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.

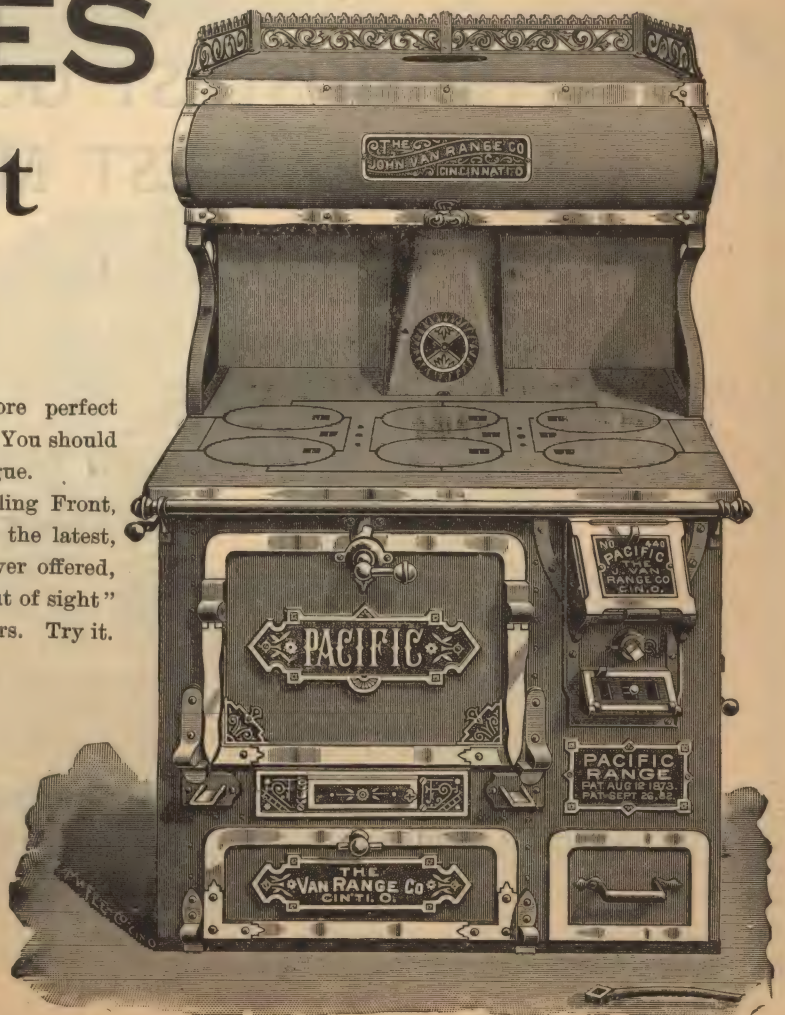
... THE ...

**John Van Range Co.**

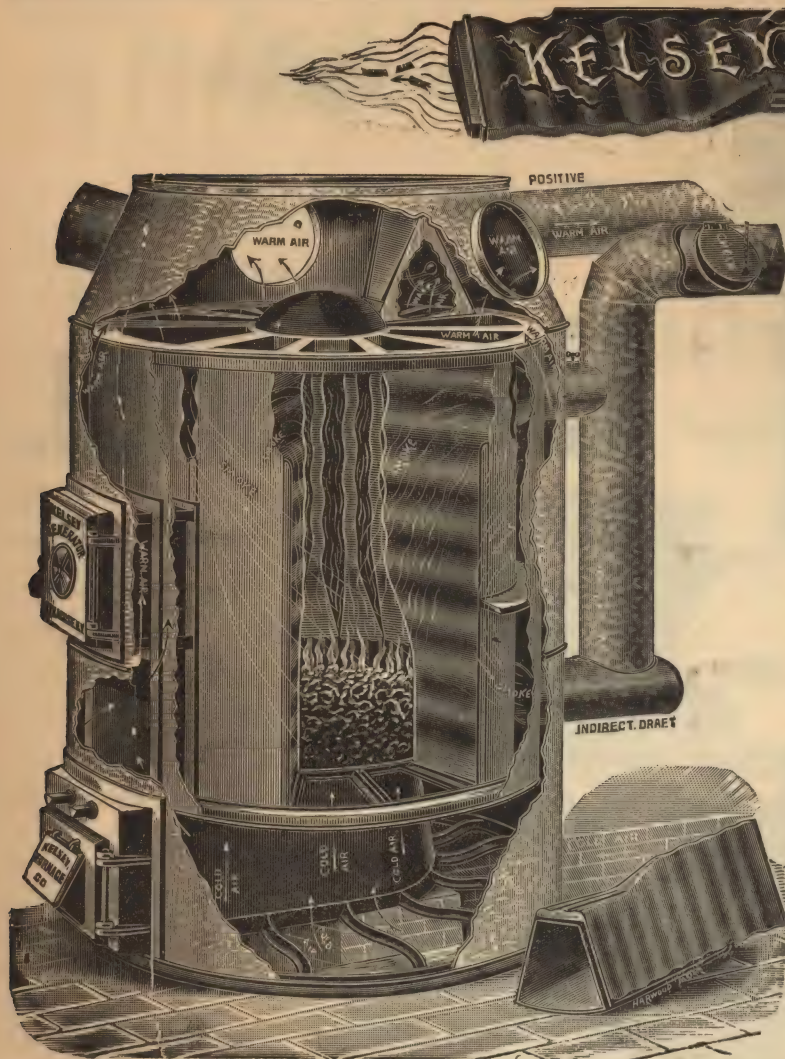
Warerooms:—419 ELM ST.;

Factories:—6-8-10 and 12 HOME ST.,

CINCINNATI, O.







## WARM-AIR GENERATORS ARE "STAYERS."

CORTLAND, N. Y., Aug. 16, 1897.

L. R. LEWIS—Dear Sir: I would say regarding the "Kelsey Generator" that I have used one in my home, and also in the First National Bank, for seven years, and consider them the most durable heater on the market. There has never been one cent spent in repairs on either of them, and the castings are as perfect now as when new. As to economy of fuel, they are unequalled, having thoroughly heated the buildings they are in at a great saving of fuel over the furnaces they replaced. I never fail to advise my friends to purchase a "Kelsey" by all means.

Yours truly,

EDWARD KEATOR,  
Pres't First National Bank.

For catalogues and prices write

**Kelsey Furnace Company,**  
SYRACUSE, N. Y.

239 Water Street, New York City.  
173 Lake Street, Chicago, Ill.

## THE MOSTEST GOODS FOR THE LEASTEST MONEY. . .

The Stove is "all right" and we can prove it to you by sending you a sample. It is "*Lansing*" the trade of our contemporaries and orders are pouring into the "*Grand Haven*," where we take care of them promptly.

## THE WOOD QUEEN,

WITH BRACKET RESERVOIR,

is a great big well made wood stove that is beautiful in design and modern in every respect. We have the first time to place a sample that has not brought in a nice order. Send for prices and secure the agency for your town.

**The Portsmouth  
Stove & Range Co.,**

Busiest makers of Stoves and Ranges  
in the world,

Portsmouth, Ohio.







# Kernan

400th Series.

## New Line

Just Out

### FIVE SIZES.

Casings,

32, 36, 40, 44 and 48 inches.

Fire Pots,

20, 22, 24, 26 and 28 inches.

Constructed Especially  
for City Contracts.

LOW DOWN  
POWERFUL **HEATERS**

Cast or Steel Radiator.

Write for Catalogue and Discounts.  
Secure the Agency now.

# KERNAN FURNACE CO.,

UTICA, - N. Y.

EASTERN OFFICE:  
**105 Beekman St.,**  
NEW YORK CITY.





# THE THERMOSTAT, A SENSITIVE PLATE.



TO HEATER DRAFTS  
OR PULLEYS.

# HOWARD

Automatic

Regulates

## DRAFT REGULATOR

## Furnaces and Boilers.

Consists of a

### Plate, Damper and Pulleys.

The **DAMPER** is operated uniformly with the changes in temperature and not opened and closed suddenly. The movement and power is obtained directly from the **PLATE**. From a normal position to wide open or closed, the change is but

ONE DEGREE.

PRICE IS POPULAR.  
GET POSTED.

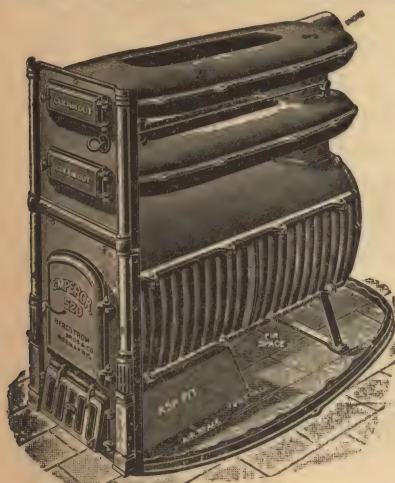
**YOU** should use it. **WHY?**  
It saves labor and worry about heater; gives nice heat; prevents danger from overheat, and

**SAVES COAL.**

MADE BY

HOWARD THERMOSTAT CO.,  
OSWEGO, N. Y.

**1/4 Off**  
LABOR,  
WORRY,  
BAD HEAT,  
DANGER,  
COAL.



# EMPEROR FURNACES

FOR WOOD.

Simple, Safe Durable.

ECONOMICAL IN FUEL.

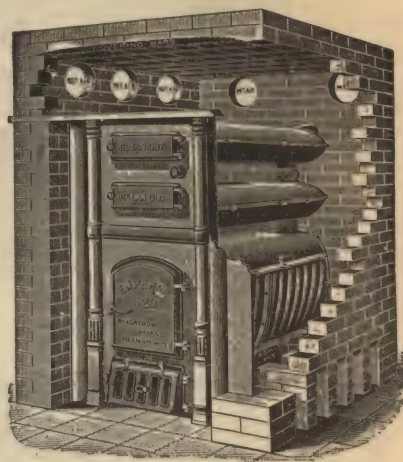
The Best and Cheapest Line of Wood Furnaces.

Furnished for either Brick or Galvanized iron Casing.

SEND FOR CATALOGUE.

*Bergstrom Bros & Co.*

NEENAH, WIS.



# FURNACES TO BURN

Hard Coal, Soft Coal, Wood, Gas.

IT WILL NOT COST YOU ANYTHING TO GET OUR CATALOGUE AND PRICES.

**THE RICHMOND STOVE COMPANY,**

New York, 85 Centre Street.

NORWICH, CONN.

# FURNACES

AND

# FITTINGS.

ALL SIZES, ALL KINDS.

IN ENDLESS VARIETY.

FIRST CLASS GOODS

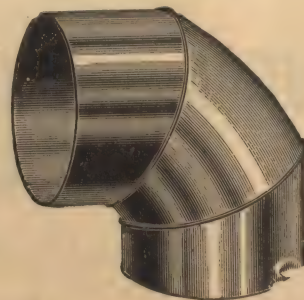
AT ATTRACTIVE PRICES.

**THE EXCELSIOR STEEL FURNACE CO.,**

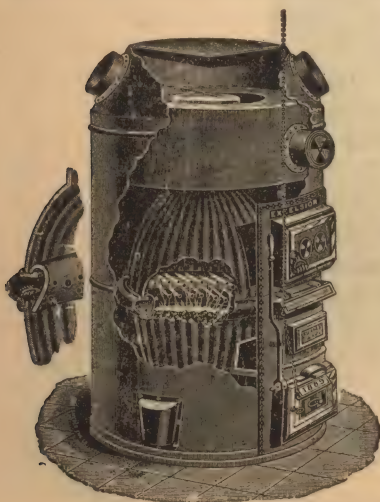
38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates,  
Radiator and Gas Ring of Furnace shown above.

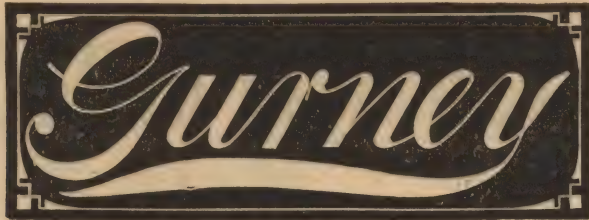
The Original  
and only  
Complete Line



of Furnace  
Pipes and  
Fittings.







**HOT WATER HEATERS and STEAM BOILERS** have proved themselves to be eminently satisfactory to the Trade and Fitter, in general, wherever used.

It shows a **Bright Idea** on the part of the fitter when he recommends the use of Gurney Boilers, as he knows they will stand up to their ratings and do all that we claim they will.

SEND FOR LATEST TRADE CATALOGUE.

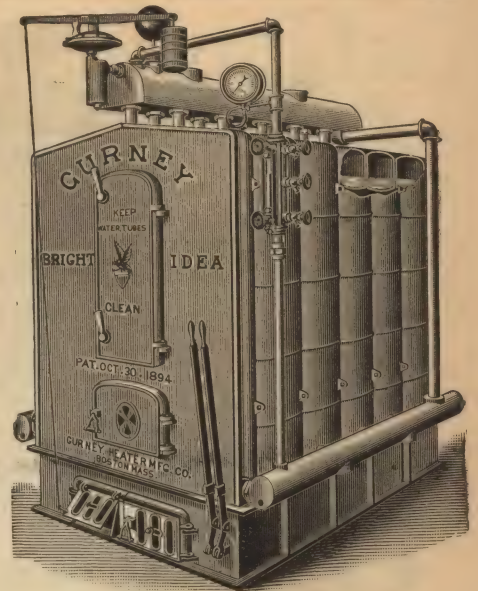
SOLD THROUGH THE TRADE.

## GURNEY HEATER MFG CO.,

74 Franklin Street, Cor. Arch,

BOSTON, MASS.

New York Branch:  
48 CENTRE STREET.



"BRIGHT IDEA"  
Safety Water Tube Steam Boiler.

**KEEP The Plummer Heaters.**  
**YOUR**  
**I**  
**ON**

THE PLUMMER BRICK SET **STEAM HEATER,** NEW MODEL.  
THE **LEADER** HOT WATER HEATER.

Made in our own plant. Send for Catalogue.  
THE PUTNAM FOUNDRY & MACHINE CO., - Putnam, Conn.

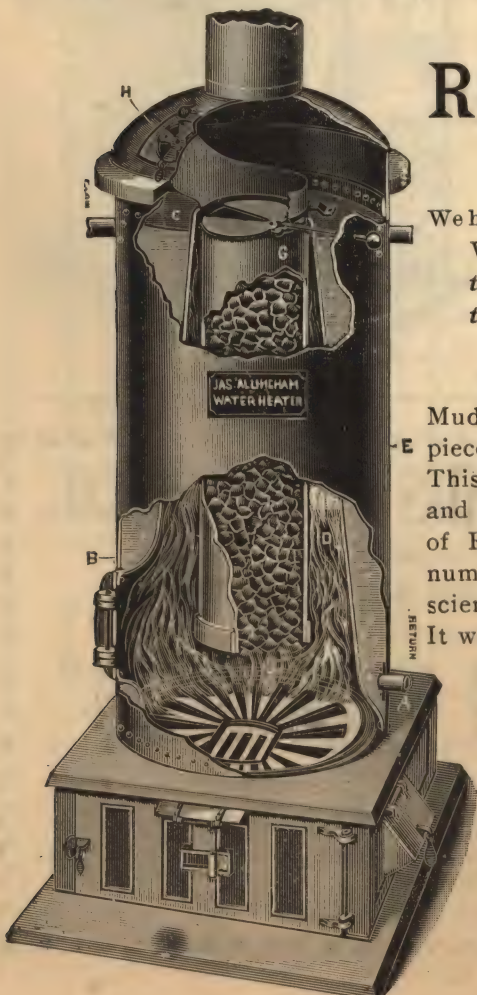
## The James Allingham Hot Water Heater.

MANUFACTURED BY THE

## Rockford Grate Company,

Office and Works, 146 to 160 Bunker Street, CHICAGO.

We have purchased the exclusive right to manufacture the James Allingham Hot Water Heaters, and reconstructed and improved the patterns to such an extent that we are now prepared to offer the trade a Hot Water Heater superior to any similar Heater on the market.



The Boiler is built with a cone flue but without Cast Iron Dome, Mud Ring or Door Frame. The entire Boiler body is made from three pieces of Flange Steel. The Cone is swedged out at the bottom and door. This with the Steel Head allows for the unequal expansion of the Cone and outside sheet and therefore no breaking of Calking Joints, drawing of Rivets, or buckling of Cone, and less liable to leak owing to less number of joints. The superior construction of Grate, large Ash Pit and scientific Draft Openings insure perfect combustion and easy regulation. It will boil water in less time, with less fuel, and the fact of its endorsement by the U. S. War Department gives it a superiority over any other boiler made. The Cone Flue construction starts circulation almost as soon as fire is started, as we have only a small amount of water to heat located where the fire is hottest.

WRITE FOR COMPLETE DESCRIPTIVE CIRCULARS AND PRICES.

We also manufacture an Artistic Line of Round Fire Pot Fire Place Grates for Hard and Soft Coal and Gas.



# Some Furnaces

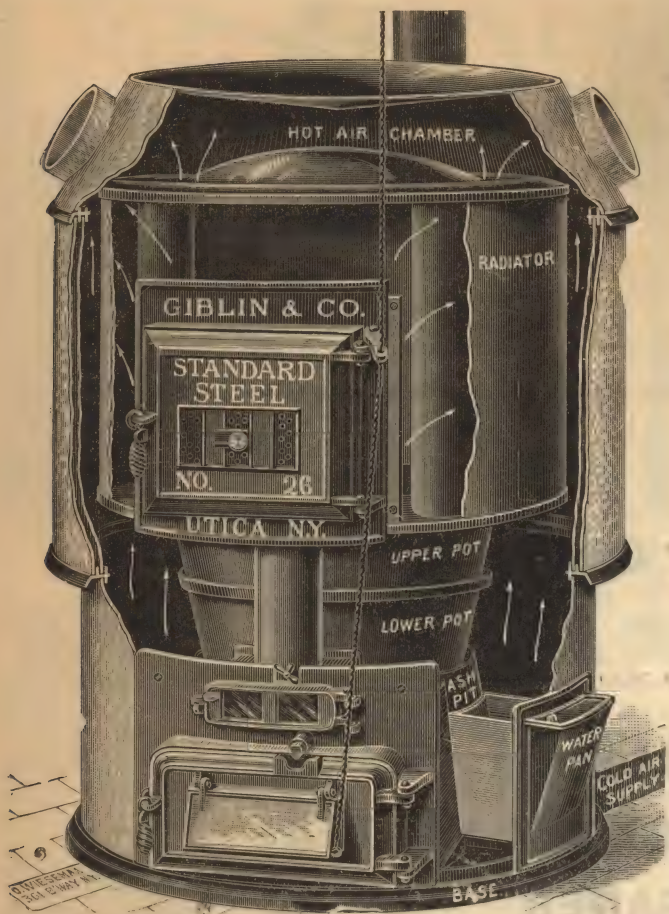
Fail to Heat,  
Have an Enormous Appetite  
for Coal,

Require almost a person's whole time to manage,  
Produce more gas and dust than heat,  
But these furnaces are

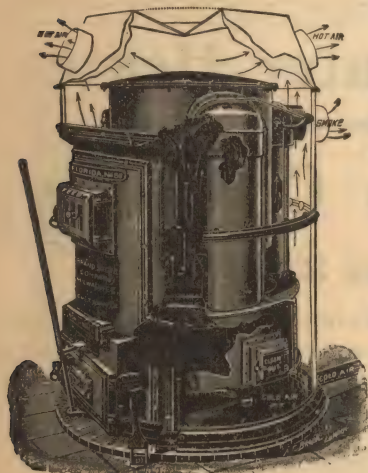
## NOT Standard Steel Furnaces.

**GIBLIN & CO.,**  
Utica, N. Y.

Our  
Catalogue  
tells what  
the furnaces  
are and do.



**THE FAMOUS FLORIDA.**  
FOR COAL.



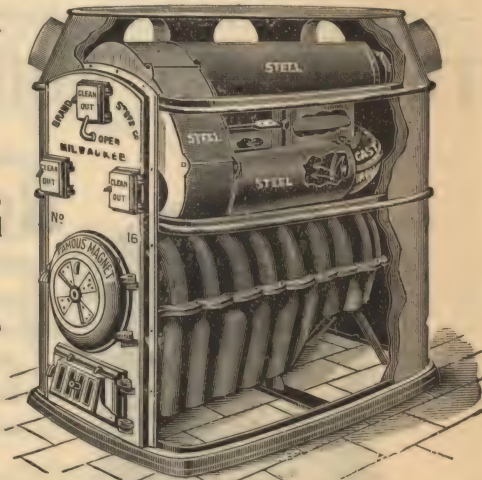
## Brand's Famous Furnaces.

Revertible Flues.	Efficiency in Heating.
Extra Large Radiator.	Large Radiating Surface.
Heavy Fire Pot.	Easy Access to Radiator.
Revolving or Flat Grates.	Durability Unsurpassed
Very Large Ash Pit Door.	Made in 3 Sizes.
Spacious Ash Pit.	38-50-60 Inch Fire Boxes.
Gas and Dust Proof.	

WRITE FOR CATALOGUE.

**BRAND STOVE CO.,**  
MILWAUKEE. CHICAGO.

**THE FAMOUS MAGNET.**  
FOR WOOD.



## THE SIMONDS FURNACE CO.,

SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,

No. 50 CLIFF ST., NEW YORK,

Manufacturers of the Celebrated

### "CULVER AND MONTANA FURNACES."

Double and Single Oven Ranges, with special features and latest designs.

**STEAM AND HOT WATER BOILERS.**

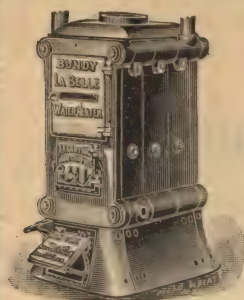
Our new Elliptic Furnace has unequalled radiating surface and is sure to give satisfaction.

Send for Catalogues and Prices.





"SURE CURE FOR A COLD HOUSE."



BUNDY LA BELLE HEATER.

**Bundy**  
TRADE MARK

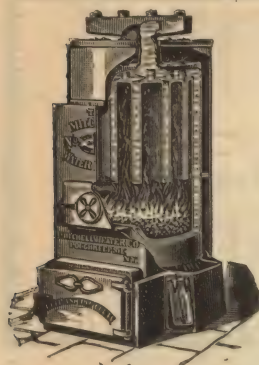
HEATERS.  
RADIATORS.  
SUPPLIES.

STEAM TRAPS.  
SEPARATORS.  
FEED WATER HEATERS.

**A. A. GRIFFING IRON CO.**

New York, 66-68 Centre Street.  
Boston, Mass., 177-179 Fort Hill Square.  
Philadelphia, Pa., 702 Arch Street.  
Works, Jersey City, N. J.

Send for Book—MW.



## The Mitchell Water Heater.

*Has no Joints to Burn Out or Leak.*

*Heating Surface all in One Casting  
Water Passages all Vertical.*

*Largest Amount of Fire Surface*

**OUR 100 SERIES**

**FOR STEAM OR HOT WATER.**

Is constructed on the same general principle, but arranged to be used without jacket.

If you have competition and want to make a low estimate to secure the job, we can help you do it.



Write for . . .

Catalogue and Prices.

**THE MITCHELL HEATER CO.,** 50-60 Pine St.,  
POUGHKEEPSIE, N. Y.

More actual talking points in the Front Rank Furnace than in any other now offered to the trade. For satisfaction—use the Front Rank.

There are more Front Rank Furnaces sold in the City of St. Louis than all the other furnaces combined. Houses with them in stay rented. To rent your house use Front Rank.

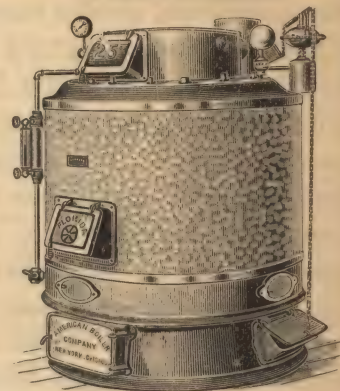
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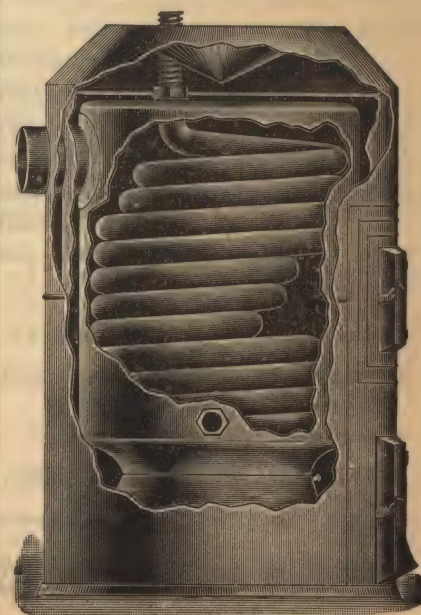
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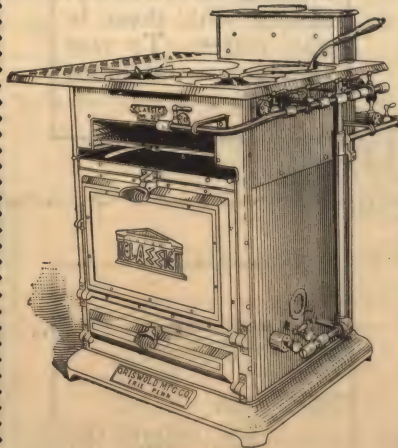
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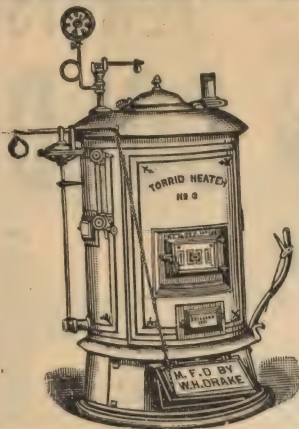
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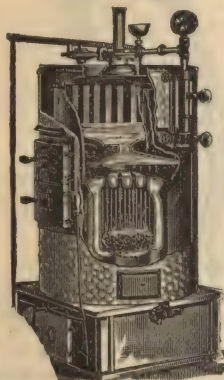
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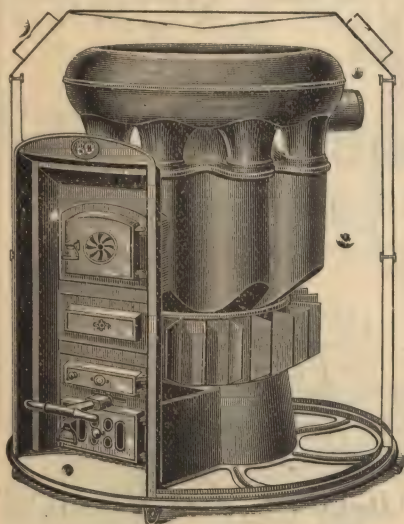
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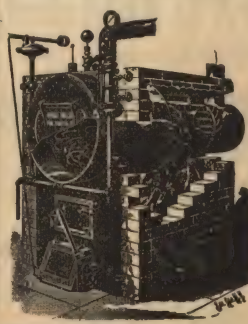
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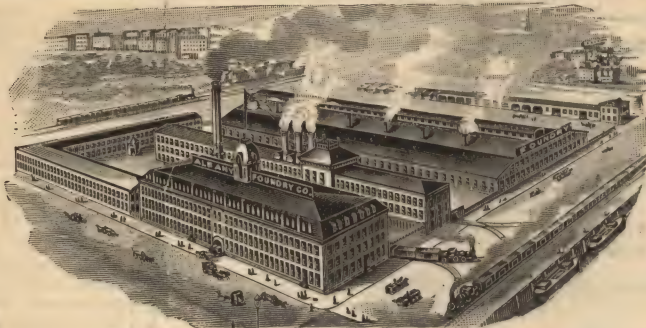
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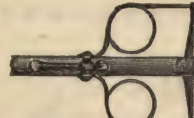
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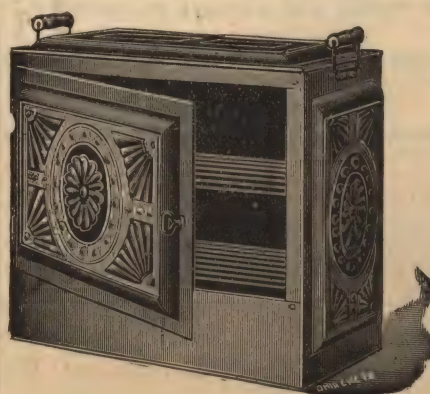
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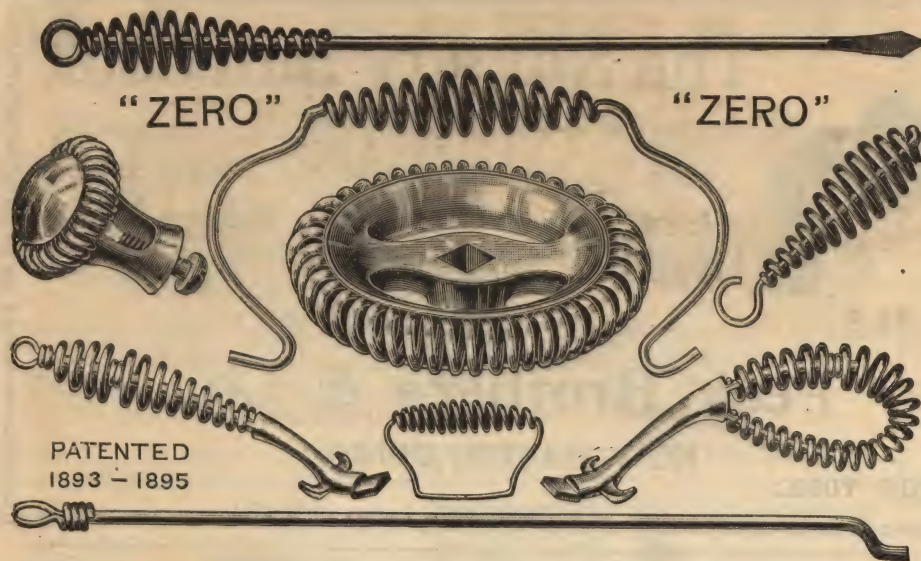
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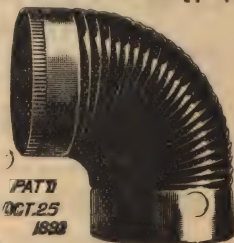
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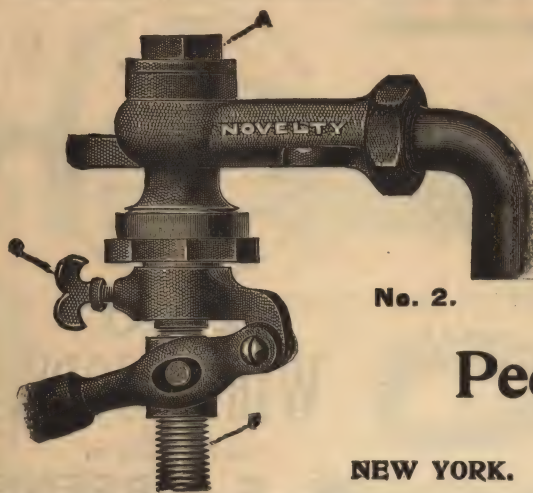
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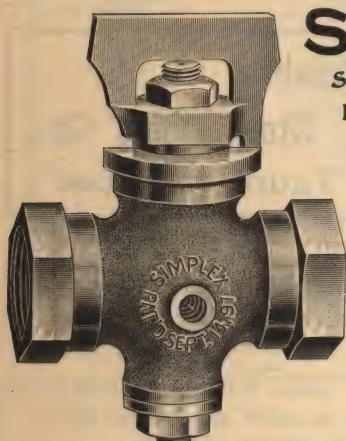
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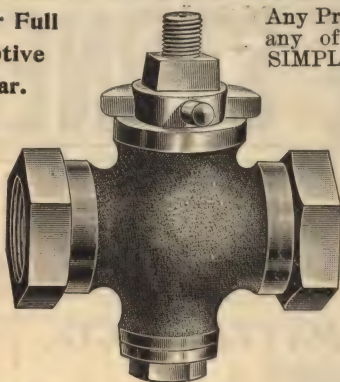


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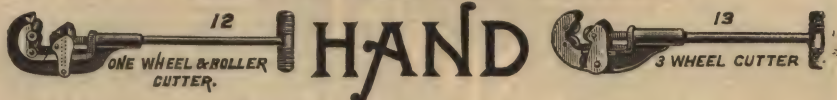
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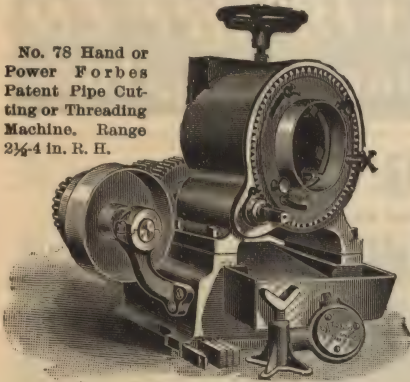


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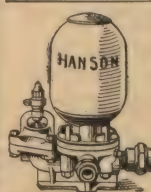
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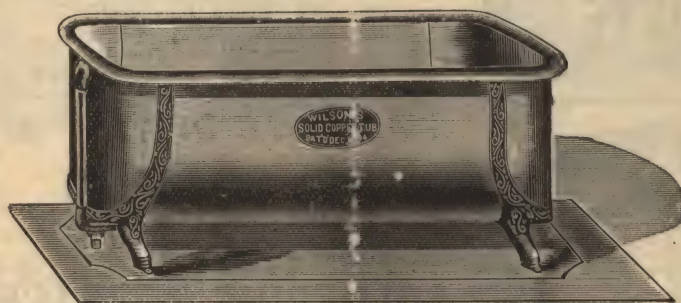
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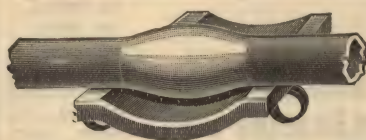
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THE MOST SANITARY TUB IN EXISTENCE.

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Tubs, Copper  
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Ask your dealer  
for prices. Send  
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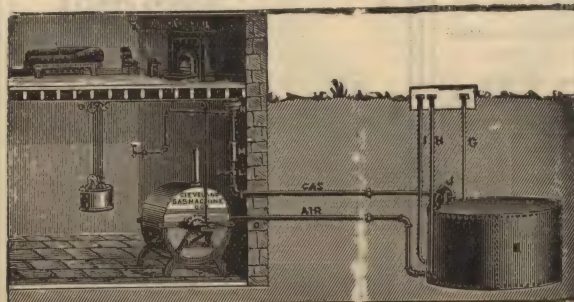
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PATENT APPLIED FOR.

For thirty days only we will send two of Porsch's Moulded Wiping Cloths instead of one, just to introduce it; and for the working surface the finest moleskin cloth is used, or herring bone ticking, to suit the purchasers. These will wipe joints on any size pipe from ¼ to 4 inches.

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tories; it is also used for cook-  
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also make Special Machines for  
furnishing gas for canning  
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**Acetylene Gas Apparatus.**

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Established dealers prepared to pipe buildings  
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STEADY CURRENT INSURING EVENNESS OF COLOR.

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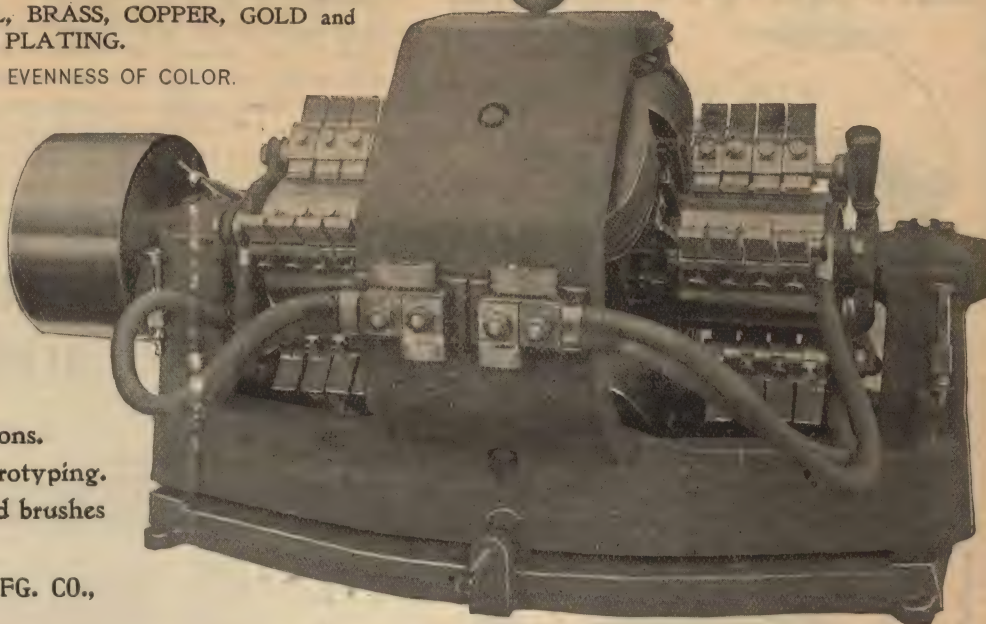
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ABSOLUTELY WATER TIGHT

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Miscellaneous Tables, Questions and Answers on the Principal Topics of Interest to the Craft. Also a Dictionary of Terms of Value to a Plumber.

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123. Pages, Pocket Size, Cloth, \$1.00.

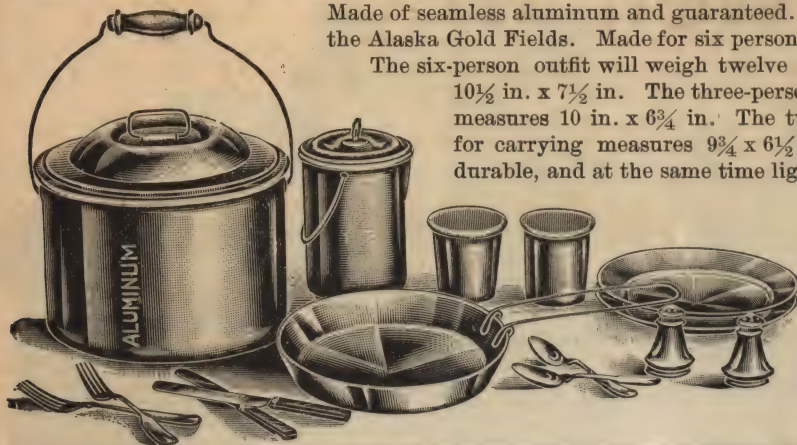
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in special hard  
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We make the very highest grade only. Cheap goods are not in our line.

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90 Canal St., BOSTON, MASS.

—"My heart is punctured!" she sobbed. They strove to comfort her, and not without success.

"Oh, I suppose I can bump along on the rim," she finally exclaimed, smiling bravely through her tears.—*Detroit Journal.*

—Reporter—"It is said that you and O'Hoggarty were calm and collected after the dynamite explosion at the quarry?"

Clancy—"Well, it was like this. I was calm, an' O'Hoggarty was collected.—*Tut Bits.*

—RAGGS—"Did you hear that noise? Sounded like an explosion!" Jaggs—"So it was. The wind just blew up State street."—*Exchange.*

—DODGELY—"I tell you, Doolittle, a woman can make or break a man."

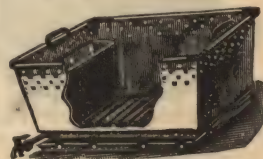
Doolittle—"I suppose so; they always broke me, but that's no sign the rule won't work the other way."—*Ex.*



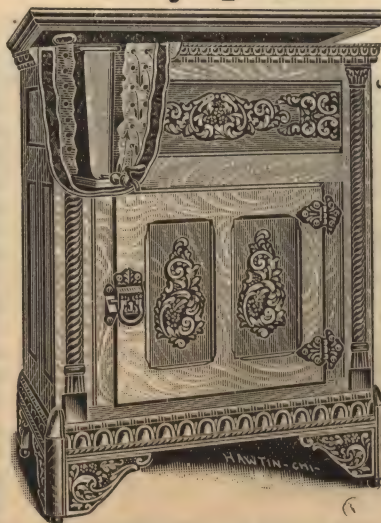
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UP TO DATE in quality. DOWN TO DATE in price. Send for catalogue.  
**Northern Refrigerator Co., Grand Rapids, Mich.**

**The Gurney can be kept  
absolutely pure and clean**

By the use of the



**Removable Galvanized  
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## The World's Best Refrigerators

Over 60,000 now in use

Over 100 styles and sizes

IN ALL NEW GOODS.



Send for Sample to compare

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**Be Your Own Judge,**

or write us for Latest Descriptive Catalogue.

**"THE AMERICA." Our Prices are right.**

We constructed the first and only PERFECT removable ice compartment made.

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Long Distance Telephone, 303 Harlem.

Highest Candle Power.

Greatest Durability.

Entirely Free of Shrinkage.

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Goods Securely Packed for Shipping.

We are making the finest mantle ever offered. Our machinery is the latest improved, our materials and chemicals the finest imported and domestic stock that money can buy, and our labor the most skillful.

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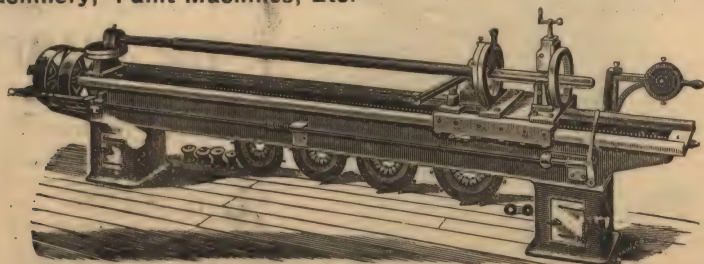
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**CONDUCTOR PIPE AND EAVES TROUGH, Corrugating Machinery, Power Squaring Shears, 36 inches to 11 feet; Beading Machines, Forming Rolls, Curving Rolls, Crimping Rolls, Grooving Machines, Tanners' Squaring Shears, Power Cornice Presses, Improved Metal Roofing Machinery, Paint Machines, Etc.**



Latest Improved 10-foot Plain Round, Round Corrugated, and Square Corrugated Conductor Pipe Machine.

**IT WILL PAY YOU TO GET OUR PRICES ON ABOVE MACHINERY.**

—INTERNAL EVIDENCE.—Lawyer Sharpsett found he would be unable to go home in time for supper. His typewriter girl having quit for the afternoon he sat down at the machine himself and succeeded, after half an hour's work, in evolving the following note, which he sent to his wife by a messenger boy:  
atthe Office 5-30p.m!

DEar miLLi e : : I shlal not be xxxxxx  
xxxat hOme t his evnennenig untill untill  
vrey veryxxxxxx late do not. wait fr  
for mEA a A ellen t w ho Has A client  
wtih whoM i haev an apopointmen t is  
xxxxx xxxxc is cmoing to enosult  
consultme & it wil taKe al al all eqnxx  
xxxevening your lvoing husgxxxxxxxx  
xxxhusbnd. j: hiraM@?

"I knew Hiram wrote it!" exclaimed Mrs. Sharpsett after she had read it. "Those x's are where he swore."—  
*Chicago Tribune.*





# St. Louis Stamping Co.,

ST. LOUIS, MO.

—MANUFACTURERS—

Granite Ironware <sup>AND</sup> Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

"L. & G."

## Improved Milk Cans

AND

## Milk Can Stock.

Made New York, Philadelphia, St. Louis, Elgin and other heavy patterns. Also Cheese-factory Can Stock.



The "L. & G." is the best and strongest Milk Can in the market.

It has the Patent Breast, Neck and Bowl, made of one piece of tough Steel.

Price-list mailed on application.

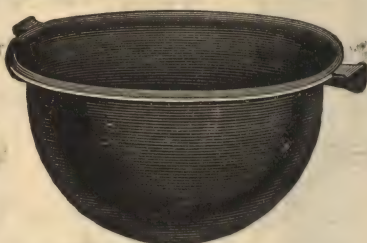
**LALANCE & GROSJEAN M'F'G CO.,**

Chicago. NEW YORK. Boston.

—EATING TO MAKE A FIT.—While Sherman was "out in the air" between Atlanta and the sea, rations sometimes got a little short; but the men were good-natured about it. One day an officer found a soldier eating a persimmon that he had picked up, and cried out to him: "Don't eat that; it's not good for you!"

"I'm not eatin' it because it's good," was the reply; "I'm tryin' to pucker up my stomach so as to fit the size of the rations Uncle Billy Sherman's a-givin' us."—San Francisco Argonaut.

## SPERRY'S CALDRONS....



Full measure, guaranteed perfect, original patterns, with metal distributed where it is needed. Many Caldrons are made from our castings as patterns. They are inferior to original, as they have light bottoms and heavy sides and hold less.

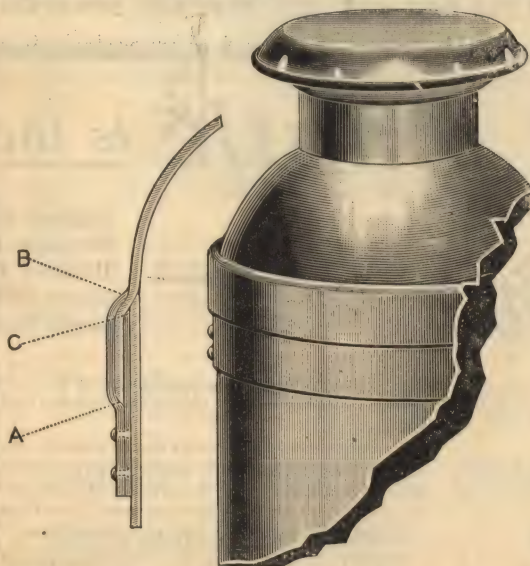
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HOLLOW-WARE FOUNDERS,

BATAVIA, ILL.

TWELVE SIZES ALWAYS IN STOCK.

## OUR NEW MILK CAN BREAST.



Used on  
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NEW YORK  
**PATTERNS.**

Breast is firmly locked between sections of hoop and all retinned into one solid piece.

**Strongest  
Possible  
Construction.**

**Seamless Neck and Bowl.**

Breast firmly gripped between shoulder, A, and top of hoop turned inward, B. Cannot be displaced up or down. Also supported by hoop, C.

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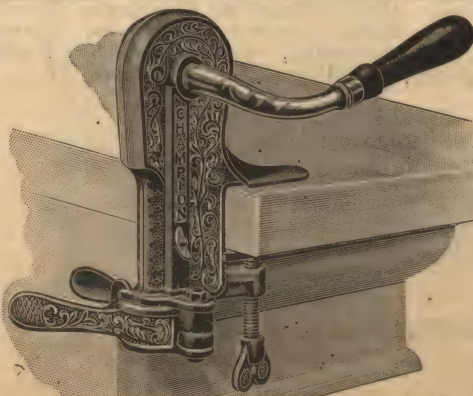
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THE HIT OF THE  
SEASON.

Sizes, 1 and 1½ Bush.



Be sure to order at once.

# Utility Steel Baskets

Japanned  
and Galvanized.

Made from Refined Smooth Steel.

**STRONG,  
WATER-TIGHT,  
EVERLASTING.**

Suitable for Measuring  
and Handling

Grain, Vegetables, Coal, etc.,  
Feeding Stock,  
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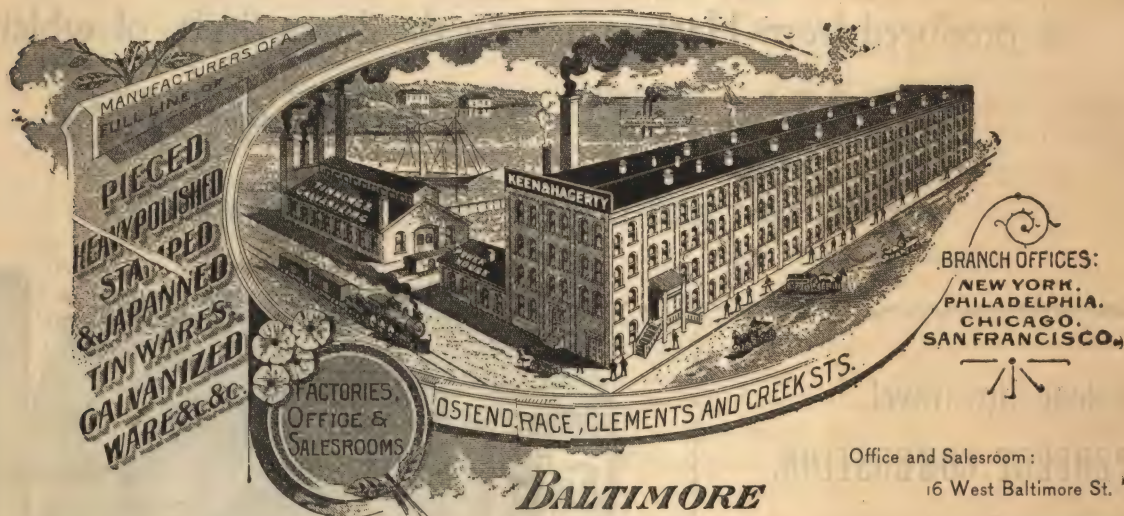


Handle Patented August 4th, 1896.

MANUFACTURED BY

**KIECKHEFER BROS. COMPANY, Milwaukee, Wis.**

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THE NEW HAMMOCK.  
PALMER'S UTOPIA.

—Position easily changed,—  
Ranging from sitting to sleeping.

## THE NEW HAMMOCK ... PALMER'S UTOPIA.

We still lead the world in variety of colors, styles  
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### PERFECTION AND ARAWANA HAMMOCKS.

Infringers are being prosecuted.

See our Catalogue for special assortment  
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Screen Cloth, School Bags, etc., etc.

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# HOWARD FURNACES

ARE OF THE HIGHEST ORDER OF  
EXCELLENCE.

It is fully known to those who have had the most experience that the

*GREATEST HEAT*

with the

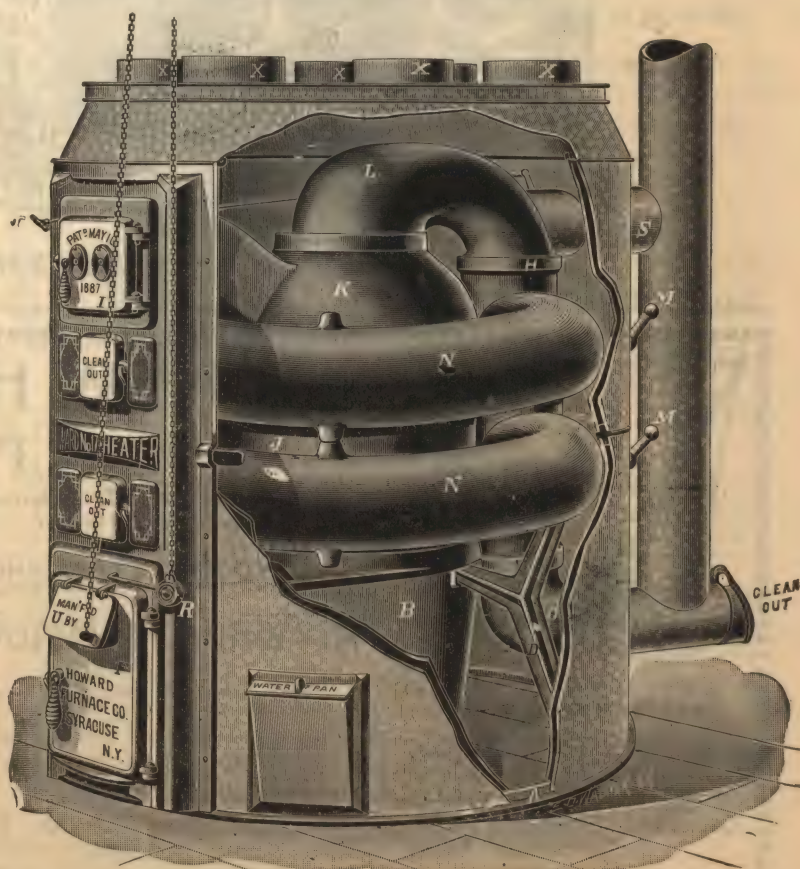
*SMALLEST SUPPLY OF FUEL*

is produced from Heaters having the down draft, of which

*HOWARD FURNACES*

are the best and most PERFECT TYPES.

A long fire travel,  
PERFECT COMBUSTION,  
Cool smoke pipes,  
ECONOMY,  
Great radiating surfaces,  
EASE OF MANAGEMENT,  
are  
distinctive features  
of these furnaces.



## HOWARD FURNACE COMPANY,

NEW YORK

Syracuse, N. Y.

BOSTON.



# THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 12, 1898.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

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Volume XLIX.....No. 11.  
Index to Reading Matter.....Page 54.

## The Business Situation.

The course of business during the past week has been decidedly encouraging, in view of the unsettled condition of foreign affairs and the continued war talk indulged in, for circulation purposes only, by certain sensational newspapers. The public at large are gradually learning to discredit the reckless fables put forth by this happily small though noisy section of the press, and their irresponsible utterances on public matters exert a lessening influence in business or financial circles. In Wall street the sentiment at this juncture is growing more pronounced that the \$50,000,000 appropriation for national defense unanimously passed by both Houses of Congress and signed by the President this week is to be construed as making for peace rather than as a forerunner of war, and its effect has been to renew stability in market values. The stock market has had a series of moderate fluctuations, and the general public has for the time ceased buying securities to a large extent. But the tone of the market is firmer than it was a week ago, and there is an evident disposition on the part of investors and speculators to act cautiously and to quietly await the report of the Court of Inquiry on the "Maine" disaster and other further developments before engaging in new enterprises or investments. The banks are well "loaned up" and have advanced money rates materially. As borrowers are for the time being indifferent, there is something like stagnation in the money market. There have been additional engagements of gold for importation, bringing the total amount for the past two weeks up to \$13,000,000. Meanwhile the markets for staples, such as grain, cotton, meat products, &c., are very strong and the demand for manufactured products in general shows a steady increase. Trade reports indicate an excellent business in the West, reaching a larger volume than for several years past at this season. The improvement is not so pronounced in the East, but the feeling in trade circles in this section is decidedly cheerful in connection with nearly all lines of business. Prices, while showing no very notable changes, tend generally upward, especially in iron and metal lines. The strength of copper is particularly pronounced and tin and spelter have gained in value during the week. Payments through clearing houses last week were 28 per cent. larger than in 1892, while compared with last year the gain was 56.2 per cent.

## Plumbing Schools Here and Abroad.

Readers of English journals see a good many references to classes in plumbing in different English cities, but there is little definitely known here about the system of instruction as there carried on. Since the establishment of the New York Trade School attention has been more and more directed in the United States to the subject of manual and scientific instruction of plumbers, and as a consequence of this interest a number of schools have been established. We are fortunate in securing from Mr. Ainge of Lansing, Mich., an article which we publish elsewhere in this issue, giving the general features of instruction as followed in the English plumbing classes, and a summary of the American plumbing schools, together with a brief comparison of the methods obtaining in the two countries. The article will be found to present the whole question in a very compact and clear manner, and we commend it to the attention of all plumbing readers who are in any way interested in the advancement of their craft through the instrumentality of trade and technical schools. The recommendation in the closing sentence to the National Association of Master Plumbers will, we are sure, be in keeping with the thoughts of many prominent members of that important body. Whether the association as a whole wish to take official action in this matter is for them to decide, but what seems to call for immediate attention is the absolute lack of schools in the West where instruction in plumbing can be obtained.

## The Navy of Spain.

It cannot be denied that at this time the people of our country are eagerly seeking information concerning the relative value of the navy of Spain in an engagement with the naval forces of the United States. To estimate this aright many factors should be taken into serious consideration—not only the ships, the armament and the *materiel*; not only the experience, the discipline and the *personnel*, but also the prestige, the *esprit de corps* and the animus of the two services must be given due weight. Few chapters in naval history are more interesting than those which tell of the rise and decline of the power of Spain on the sea. In 1588, Spain in the plenitude of her naval strength prepared for battle the largest sea fleet ever heard of. It consisted of 130 vessels, of 57,868 tons, mounting 2431 guns and carrying 30,000 men. It sailed up the English Channel, and it suffered a most disastrous annihilation from wind, weather and an inferior English fleet. Incompetent commanders, poor seamanship and badly shaped plans assisted as much in destroying this Spanish Armada as did foul weather and a resolute foe. The complete effacement of Spain as a power on the sea occurred at the battle of Trafalgar.

A reorganization and a rehabilitation of the Spanish Navy was begun in 1837; the results, not yet altogether attained, can be seen in the ships and men composing the force about which we now are concerned.



In the way of armored tonnage Spain has on the whole builded well. She has one battle ship, the "Pelayo," of 10,000 tons, formidable in both attack and defense. For the attack she has two 12.5-inch guns, two 11-inch guns, nine 5.5-inch guns and a large number of smaller guns; for the defense, a steel belt and turrets of 18 inches thickness. Her speed is about 17 knots. This vessel is not thoroughly modern; the armor is not nickel faced nor Harveyized, neither is her internal arrangement of the best. Of armored cruisers Spain possesses ready for service perhaps six. One of them, the "Carlos V," is of 9100 tons, about the size of our "Brooklyn." Her battery consists of two 11-inch, eight 5.5-inch and four 4-inch guns. Her protection is a horizontal 6-inch steel deck at the water line, a steel belt 2 inches thick and 10-inch steel turrets. Her speed is 20 knots.

Another fine type of armored cruiser is that represented by the "Infanta Maria" class, of 7000 tons displacement. The names of these six armored cruisers are "Infanta Maria Teresa," "Princesa de Asturias," "Cardenal Cisneros," "Cataluna," "Almirante Oquendo" and "Vizcaya." They have all been launched, but are not all ready by any means. Perhaps four of them could be put into active service in a comparatively short time. They are 350 feet long, 61 feet beam and 22 feet draft. The motive power consists of two sets of triple expansion engines developing 15,000 horse-power and a speed of 20 knots. The coal capacity, 1200 tons, is noteworthy; it will permit these vessels to cross the Atlantic and stay here some time before replenishing, and gives them a radius of action at a moderate rate of steaming of 12,000 miles.

Not less admirable is the arrangement and distribution of the armament. Here are two 9.5-inch guns in turrets, 12 inches thick; ten 5.5-inch rapid fire guns in battery, and over 20 of the smaller caliber and machine guns. The protection of the vessels consists of an armored belt 11 inches thick amidships and tapering to 7 inches at the ends. Ten-inch transverse bulkheads join the extremities, thus making a citadel, within which are the machinery and magazines of the ship. Over this is the armored deck 3 inches thick. In our navy there is no ship like one of these four. There can be no doubt these Spanish ships are good fighting men-of-war, and, properly handled, are capable of fighting long and hard. Not unlike these are the two armored cruisers "Cristobal Colon" and "Pedro Aragon," 6800 tons, purchased by Spain from Italy. The "Colon" is ready. Her water line belt and citadel are 6 inches thick, the sides extending up so as to protect the ten 6-inch guns. The remaining guns of her armament are two 10-inch, one forward and the other aft, in barbettes, protected by shields 5 inches thick, and six 4.7-inch guns protected by shields. Her speed is a good 20 knots.

This closes the list of Spain's effective armored fleet. We gather from it that though small it is excellent. The ships are distinctly good ones of their types. The policy dictating the type has for its object the protection of far distant colonies. Hence the prevalence of the armored cruiser. What part the armored cruiser will play in war time has not been definitely determined by naval tacticians. She is not designed for the line of battle, being as a rule too light offensively and defensively; yet there would appear to be no good reason why a bold captain in the "Maria Teresa" should not lay her successfully alongside the battle ship "Pelayo." On the other hand, the "Pelayo," ship for ship, gun for gun, armor for

armor, is the better vessel. But the discipline of the *personnel* of the two may be different, the skill of the commanding officers may be unequal, the maneuvering of the ships may be unlike. These are factors which are quite as valuable as gun power and armor resistance. Indeed, they count for more, for the best ship that ever floated would have to strike her colors if badly commanded, no matter who might be her assailant.

It is a difficult as well as a delicate matter to discuss the seamanship of Spanish sailors—and we may not be altogether competent to do it. There have been great Spanish admirals. Columbus was one, though not a native, and there have been many others; and among the 1200 officers in the Spanish Navy to-day there must be many who know their profession—men possessed of that cool, determined intelligence which leads to victory or to glorious death. The same in a measure must be true of the 15,000 men now behind the Spanish guns, even though for years little has been heard of them, and that little has been lightly spoken. It is well then to indulge in no invidious comparisons in attempting to estimate the naval strength of Spain, ship for ship and man for man. Spain should be accounted the equal of her antagonist, whoever he may be, until the matter has been put to the test.

Only the armored fleet of Spain has been considered above, for the reason that, generally speaking, the armored fleet is the measure of the fighting capacity of a nation. Of unarmored ships Spain has a great number, and it would not be difficult to make additions. There are 18 cruisers, varying in size from 1100 tons to 5000 tons, and 25 of a smaller size, good ships most of them. As able assistants to these cruisers there are 12 torpedo vessels, ranging between 460 and 850 tons in size, and between 18 knots and 28 knots speed. They are a thoroughly efficient lot.

Spain's gun boat flotilla is a large force numerically, over a hundred, ranging in size between 400 and 40 tons. These gun boats have inconsiderable speed, most of them, but they are good vessels for service in Cuban waters, where many of them are now.

Of torpedo boat destroyers the Spanish Navy has four, new, as good in every particular as can be. They are of 380 tons displacement and 29 knots speed. Besides these there are 14 torpedo boats between 60 and 120 tons displacement, with speeds ranging from 19 to 26 knots.

In conclusion, it should be said that we believe the new navy of Spain to be a downright good one. There can be no doubt of the excellence of the ships, armor and guns. Of the experience, the discipline and the *personnel* we are not qualified to speak with certainty, though we know of no reason why they may not be equal to that of any other navy. Concerning the prestige, the *esprit de corps* and the animus, we have to say that we believe Spaniards to be brave, we believe them to be actuated by the highest motives, and we believe that in a determined effort to win once again that prestige which centuries ago made the royal standard of Castile and Aragon the proudest on the seas Spain will fight to her death.—*The Iron Age*.

Traffic officials of many of the Western railroads are again confronted with a great scarcity of cars. Traffic is so heavy in both directions that the demand for cars cannot be met as expeditiously as is desired. A car is shipped East loaded. Under ordinary circumstances it could be unloaded and sent back immediately. Now, however, it gets a second load in the East before being sent West again, and of course the detention is considerably longer. Roads find it extremely difficult to borrow from one another to tide them over the present rush. There never was a time, perhaps, when greater vigilance was displayed regarding the movement of cars than right now.



# THE LETTER BOX.

## Galvanizing Wringer Castings.

From D. W. C., Westville, Nova Scotia.—Will *The Metal Worker* please give the composition used to galvanize wringers and the process?

Answer.—We reprint the following from an article by W. F. Flanders, Nashua, N. H., in *The Metal Worker* of February 1, 1895: I do not claim that the directions given in this article will enable a person to engage in the business in all its branches and carry it on without meeting difficulties that are not contemplated here, as such difficulties will be met and they can only be overcome by experimenting and experience. Galvanizing, as understood in the trades, has no connection with electricity as a part of the process, and is simply a dipping of iron into molten zinc, the iron having been previously freed from scale or sand by the use of acids or by tumbling. To all inquiries as to the best brands of metal to use for galvanizing use only a brand smelted or handled by a reliable concern, and under no circumstances attempt to galvanize with metal whose only recommendation is its low price. For galvanizing malleable iron the metal should be kept at a uniform heat of about 30 degrees above the melting point, and its proper temperature will soon be learned in practice, so that at a glance it will be known by the color. The surface of the metal should be covered with a flux of sal ammoniac to prevent the scum or oxidized metal from adhering to the work. Malleable castings should only remain in the metal until they are of the same temperature as it is. The loss from dross and oxidation is often as much as 50 per cent. of the metal used. If the castings must be freed from sand by pickling they should be placed on an inclined platform, and a solution of 1 pound of sulphuric acid and 3 pounds of water should be poured over them every three hours for a period of from 12 to 36 hours, or until the sand washes off readily. They should then be inspected, and any remaining scale or sand should be removed by a steel casting brush or with a file, otherwise the work cannot be properly coated. Castings that have been freed from sand by tumbling do not require pickling with sulphuric acid, but can be galvanized after immersion in a bath of one part muriatic acid and three parts water long enough to remove any traces of rust. Work of all kinds should be kept covered with water until the galvanizing is to be done. Then it should be taken out of the water and immersed in a solution composed of 1 gallon of muriatic acid, 1 gallon of water and 2 pounds of sal ammoniac. After remaining in this mixture two or three minutes it should be thoroughly dried in an oven that is not hot enough to burn the acid, after which it is ready to be dropped into the molten metal. After the iron has commenced to take the metal it should be thoroughly washed in the flux of sal ammoniac floating on the top of the molten metal to assist it in taking an even coat, and it is important that the flux should be kept liquid, clean and fresh to insure the metal taking as rapidly as possible to the work. The proper consistency of this flux is important to the operation, and its effect on the work should be carefully noted to keep it in as near a perfect state as possible. After the work is thoroughly coated the surface of the metal should be carefully skimmed aside for a space, and the work should be slowly and carefully drawn out, all the while being sprinkled with powdered sal ammoniac to cause the metal to flow freely from the work to leave it smooth and bright. The work should be held over the metal till it drips; then it should be dipped in clean cold water and held there till the coating sets. If a spangled appearance is desired the

work should not be wet until the formation begins, and then dipped quickly into water till the sal ammoniac is all washed off.

## Water to Boiler Surface.

From A., New Jersey.—Will you kindly tell in an early issue of *The Metal Worker* what is considered the right quantity of water to 1 square foot of fire surface in a low pressure house heating steam or hot water boiler?

Note.—This is a question which it seems almost impossible to answer, owing to the many types of boilers made, but we shall be glad to have those of our readers who have experimented in this line express their views in reference to it. In consulting a catalogue of a prominent manufacturer and taking a vertical sectional boiler, we find that the intermediate section has a proportion of 3 quarts of water to 1 square foot of surface. On consulting the catalogue of another manufacturer we find that less than 2 quarts of water are provided for 1 square foot of surface. It is generally considered that owing to a hot water heating system being full of water throughout, it is not necessary that the boiler should hold as much water in proportion to the surface exposed as a steam boiler. As to the right quantity of water to be supplied for 1 square foot of surface, it depends upon the character and construction of the boiler. The quantity of water is of less importance than the provision of ample water ways to permit of a free circulation within the boiler, so that the hottest water may readily rise to the highest point. There should be no point where under heavy firing the steam globules in a steam boiler would be prevented from reaching the steam chamber, or globules of steam would form in a hot water boiler and impede circulation.

## Repairing Agate Ware.

From J. G. R., San Jacinto, Cal.—Will *The Metal Worker* kindly let me know how I can repair agate ware without soldering, or if it is soldered is there any agate enamel to put on to make it look well after it is repaired? I think I saw something in reference to this in *The Metal Worker* a few years ago.

Note.—We will be glad to hear from any of our readers who can give information on this subject. The articles which have appeared in *The Metal Worker* on repairing agate ware state that the coating should be chipped away from the leak, then the iron scraped bright, so that it can be readily soldered. Nothing has come to our notice for enameling iron ware which could be used for repairing that would stand the heat of cooking. If the hole is a small one a copper rivet can be used with satisfaction in many instances.

## What Makes the Radiator Noisy?

From T. B. C., Newark, N. J.—The inquiry of "J. R. M." in *The Metal Worker*, February 26, can be easily answered by himself if he will examine the construction of a globe valve. He will find that the seat of the valve disk will form a dam to hold water up to nearly half the diameter of the pipe to which it is attached when the valve is placed so that the wheel is on the top. I think he will have no more trouble if he turns the globe valves on the second-floor radiator so that the wheels will be on the side. In this position the valves will allow the water to run out of the radiator and stop the noise. A globe valve should always be placed so that it will not hold water.



### Laundry Drier.

From G. H., New York.—Answering the inquiry of your correspondent, "C. B. H.," Tariffville, Conn, in *The Metal Worker*, March 5, in regard to a cheap method of building a drying room for a dwelling. I suggest that between the carpenter, the tinsmith and the stove man a very cheap drying apparatus may be constructed in a laundry room or kitchen. From my own experience in building drying rooms I submit the accompanying

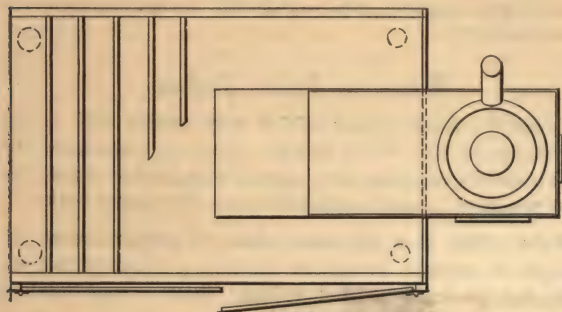


Fig. 1.

sketches, which will, I think, meet the want of your correspondent, Fig. 1 being a plan, Figs. 2 and 3 vertical sections and Fig. 4 the detail of fastenings with the clip and slide for holding the clothes horses. The plan represents a drying room 4 x 6 feet for 11 clothes horses. With continuous drying from six to eight horses is sufficient for small families. The sides and top may be matched  $\frac{3}{4}$  stuff and the framing  $1\frac{1}{4}$  x  $2\frac{1}{2}$  pine. The slides for holding the horses may be  $\frac{3}{4}$  x 2 inches, with a rabbeted strip for holding the clips, nailed or screwed to it to form the groove, as shown in Fig. 4. The clips may be made of No. 12 sheet iron and screwed to the stiles of the horses. The rails may be halved and clinch nailed to the stiles. The flat top ironing stove of the stove trade is best suited if placed on the same floor with the drier, and may be so arranged that the sheet iron cover can be removed and the stove used for heating irons.

For safety the stove should be boxed in with sheet iron and a sheet iron apron extended into the room, sup-

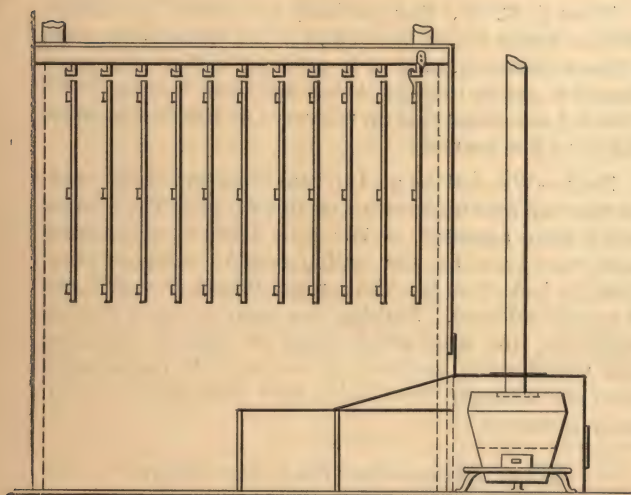


Fig. 2.

ported on small stanchions, for equalizing the flow of air. An opening in the sheet iron box opposite the opening into the dryroom serves to impinge the cold incoming air directly against the stove. There should be a stove pipe ventilator at each corner brought together and carried to a chimney flue not used for fire or up through the house to the roof with a hood. If there is room over the drier the partitions may be run up to the ceiling of the room with the holes in the cover of the drier at the corners, and a single ventilator to a flue or to the roof. To charge the

dryroom the horses may be unhooked and set at the further end of the room, and one at a time hung and the clothes put on—or if the heat is on, one at a time may be

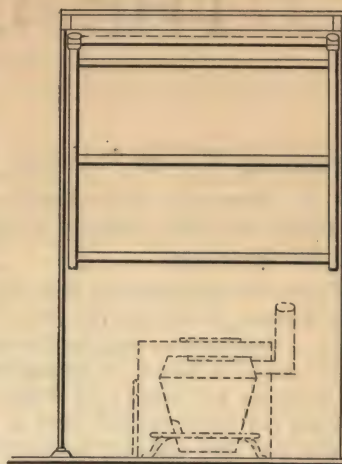


Fig. 3.

drawn out through the door and hung on a pair of hooks outside of the room, charged and slid into place. This makes a convenient and snug drier with no rails extending out into the room, and if the stove can be placed in

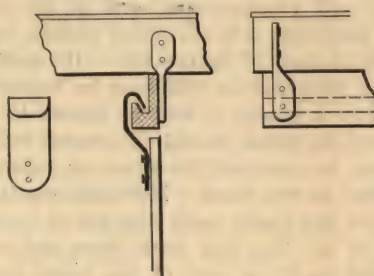


Fig. 4.

the cellar with an air casing leading through the floor the drying room may be made a neat and ornamental adjunct of a kitchen or laundry room.

### Lead Lined Tanks.

From C. L., Grand Rapids, Mich.—In this country we have more or less trouble with lead lined tanks. The water has some effect on the lead so that in a short time the bottom of a tank is full of pin holes. In the first place the spots look white and after a while they turn to a dark green color. If then a knife is taken and the spot scraped it will be found that there are holes in the lead. I would like to ask if there is any protection against this trouble. I have lately painted the lining with white lead paint after the tank was ready for use and it served as considerable protection. Is there anything better than white lead, and also does any one know what makes the dark green spots on the lead? The tanks are used for pressure in the attic and are fitted with force pumps. We found at times that a little sand was pumped up and thought perhaps that was the cause of the trouble. Any information on the subject to overcome the trouble I should be very glad to receive.

The work of erecting the new steel arch to replace the upper suspension bridge across the river at Niagara Falls is now progressing with some little rapidity. For a time there was delay in the arrival of steel, but now it is reaching the point of operation in good quantities, and its erection is going forward satisfactorily.

Operations will be commenced soon on a new shaft in the coal mines at Blossburg, N. M. This work will necessitate the installation of considerable new machinery. It is also proposed to erect 18 new coke ovens on the site.



# THE RETAIL STORE.

## Rockford Grates.

The 'Rockford' Grate Company, 146 to 160 Bunker street, Chicago, are manufacturers of high class fire place furniture. They have recently placed on the market the Leader grate, which possesses so many features of interest that illustrations are herewith given. Fig. 1 is a front view, showing the beauty of the design and the high character of the molded work. It is finished in bright, antique and Japanese copper, bright and antique brass, nickel and Berlin black. Fig. 2 is a front view and Fig. 3 a side view of the Leader back. The combustion chamber is a heavy round fire pot, with a shaking draw center grate, adapted to either hard or soft coal, but having no corners

The various styles in which the grate is made, as well as other high-class products of the company, are most attractively illustrated and described in a catalogue now ready for distribution. This catalogue is itself a work of art, being composed of heavy plate paper, the leaves fastened together with a silk cord. It comprises 64 pages, the size of the pages being 9 x 12 inches. Few publications can boast as handsome engravings and letterpress.

Albeck & Dolt, who have recently embarked in business at Manlius, N. Y., as successors of Dewey & Cadwell, are desirous of receiving catalogues, price-lists, &c. They are carrying a varied stock, including Hardware,



Rockford Grates.—Fig. 1.—Front View of the Leader Grate.

or projections for the lodgment of ashes. The fire pot is not only large, but projects from the tiling, so that heat is radiated sideways as well as in front. The reflecting plate and hood are so arranged that the heat is thrown forward and down, and thus the mantel is not only protected but the heat is placed where it is most needed. The fire pot and grate are made of heavy cast iron and the back of extra heavy cold rolled sheet steel, thus insuring durability in both cases. The dampers are regulated from the outside and are so arranged that when one is closed the other is sufficiently open to allow all smoke and gas to escape. The ash guard and draft slide fit closely, so that the air supply is under absolute control. A grate of this character is the cleanest because the ashes are only dropped in the center, no openings being in front to allow them to sift out. This grate can be readily changed from a coal to a gas grate.

Stoves and Tinware, House Furnishing Goods, Pipe and Fittings, Bicycles, &c., and also conduct a plumbing and repairing department.

F. W. Berry, Luray, Va., has moved his storeroom with stock 48 feet from the former location. The establishment is 24 x 60 feet, with two 10-foot stories. Mr. Berry has erected a wareroom, 20 x 17 feet, in the rear of the store. He handles Hardware, Stoves, Tinware, Sporting Goods, Agricultural Implements, &c.

J. Sidney Smith, one of the best known traveling men of New England, who has been for the past 27 years with the St. Louis Stamping Company and their predecessors, severed his connection with that concern March 1. Mr. Smith will be much missed by his numerous customers and his fellows on the road, among whom he is very pop-



ular. The trade will regret his retirement, and it is hoped that it may not be permanent. Mr. Smith desires, through the columns of *The Metal Worker*, to thank his

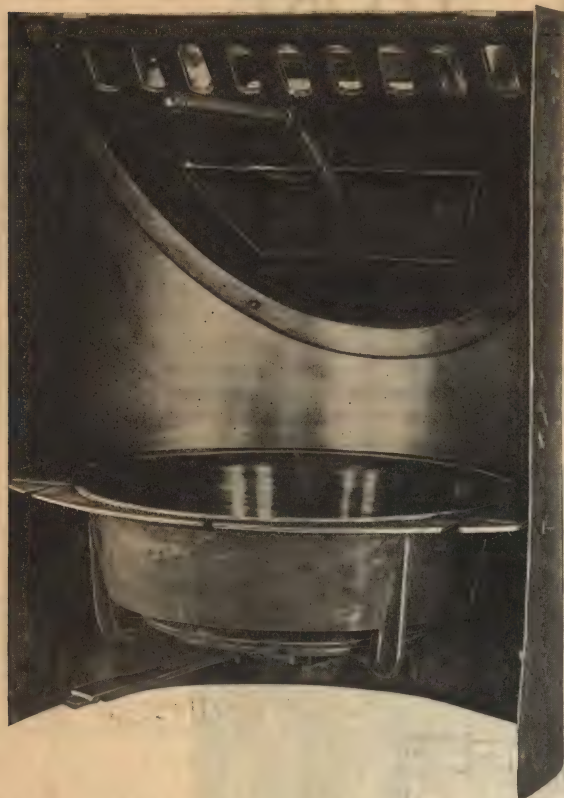


Fig. 2.—View of Back.

friends for their uniform courtesy and loyalty and to assure them of his grateful remembrance.

### The Glacier Refrigerators.

The Northern Refrigerator Company, Grand Rapids, Mich., have issued an illustrated catalogue and price-list of what they describe as the famous seven-walled Glacier cold dry air refrigerators of their manufacture. Their catalogue, containing 50 odd pages, presents illustrations

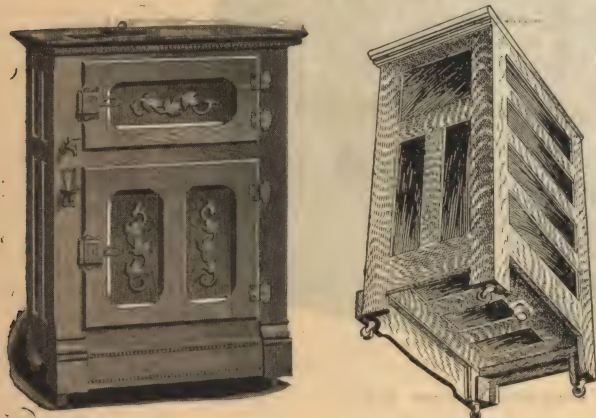


Fig. 1.—General View of New Style

Fig. 2.—Showing Back and Bottom Paneling.

The Glacier Refrigerators.

of all styles and kinds of refrigerators of this type, besides giving descriptive particulars and full price-lists, while at the end of the catalogue are samples of the insulating charcoal sheathing and felt used in the construction of these goods. The manufacturers point out that they have made many improvements in their refrigerators this year, the new style being illustrated in the accompanying cut, Fig. 1, the changes including a complete remodeling of the design. They are now much more ornamental than before, the carvings being raised instead of sunk, and the proportions and moldings have been entirely remodeled.

The backs and bottoms of the refrigerators are paneled as nicely as the fronts and sides, an illustration of an overturned refrigerator showing the bottom and back being presented in Fig. 2. The manufacturers also allude to improvements in the metal work, especially in the metal ice racks and removable flues. The locks for these refrigerators are made entirely at the Northern Refrigerator Company's factory, and are of solid bronze with a wedge-shaped latch which draws the door into an air tight joint. It is pointed out that the door can be opened or closed with the foot if necessary.

### MEMORANDA.

J. M. Martin is about to embark in business in Salem, Iowa. He will handle a general line of Hardware, Stoves and Tinware. Mr. Martin expects to be ready for patrons by April 1.

A. E. Marsh has succeeded to the business of S. R. Gray of Lime Springs, Iowa. The stock comprises Shelf and Heavy Hardware, Agricultural Implements, Stoves and Tinware, Sporting Goods, &c.



Fig. 3.—Side View of Back

Noble & Hartman began the retail Hardware business in Lyons, N. Y., on February 1. They are carrying both Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

Gilbert & Son have succeeded Gilbert & Hines, wholesale and retail Shelf and Heavy Hardware and Stoves, New Oxford, Pa.

Theodore Sigler expects soon to open up in business in Linesville, Pa. Mr. Sigler will handle Hardware, Stoves, Tinware, Sporting Goods, &c., and will conduct business on a cash basis.

Shaw & Dibblee have bought from D. E. Curry the Hartland tin shop, at Woodstock, N. B.

T. C. Mapes has opened a tinsmithing establishment at Sanilac Center, Mich.

William Koch, Mitchell, S. D., is modernizing his building at the corner of Main and Second streets, and when completed will use a part of it for his tin shop.

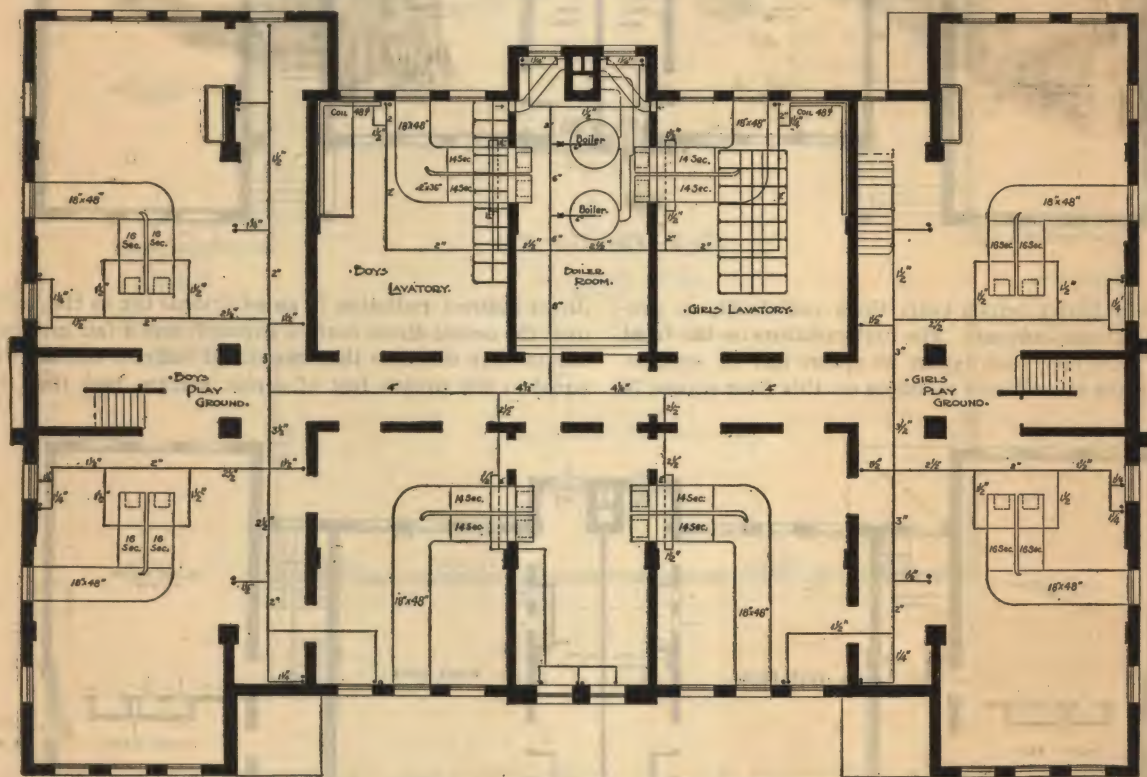


# HEATING AND PLUMBING.

## HEATING AND VENTILATING A BAYONNE SCHOOL.

The new Third Ward School Building at Bayonne, N. J., has been erected from plans and specifications furnished by Architect Hugh Roberts, 76 Montgomery street, Jersey City, N. J. A low pressure steam heating and ventilating system has been installed in the building by Baker & Smith of New York City, using Gorton side feed boilers made by the Gorton-Lidgerwood Company, 96 Liberty street, New York. Fig. 1 presents a plan of the basement of the building, showing the location of the two special No. 38 Gorton boilers, connected with an 18 x 24 smoke flue by means of 12-inch smoke pipe made of No. 12 galvanized iron. The heating main is 6 inches in size when

this it will be seen that for each 210 square feet of indirect surface used for heating the inner rooms there is a cold air supply of 43½ inches, and the area of the warm air shaft leading from the stack is 324 square inches. The corner rooms are heated by similarly arranged stacks with the same amount of cold air supply and leading into hot air stacks of the same size. The radiators used for heating these rooms, however, are composed of 16 sections and present 240 square feet of heating surface. The cold air supply and the warm air flues connecting with the stacks are so arranged that by means of mixing dampers, operated by levers placed in the various class rooms at the teachers' desks, either cold air, warm air or mixed air can be supplied at will, the damper controlling device



Heating and Ventilating a Bayonne School. — Fig. 1. — Basement Plan

starting from the boiler and runs as shown in Fig. 1, the returns from the different radiators, risers and coils being one size smaller than the flow connection, and following the line of the main in the return to the boilers where they connect, a check valve being placed on the return at each boiler. Valves are also placed on the flow and return connection, so that either boiler can be shut out of use when desired.

Fig. 2 is a plan of the first floor and Fig. 3 a plan of the second floor. The third floor, which is shown in Fig. 4, is used as an assembly room. The class rooms on the second floor are heated by means of indirect radiation, placed at the base of 18 x 18 inch hot air flues. These heating stacks are located as shown in Fig. 1, the inner rooms being provided with a stack of indirect radiation composed of 14 sections, exposing 15 square feet of surface to each section, or a total of 210 square feet. The stacks to first and second floor rooms are placed side by side, and the cold air for supplying the two stacks is brought in through one large duct, 18 x 48 inches, so arranged that each stack gets its proper proportion of cold air. From

being provided with indicators to show the position of the mixing damper and the kind of air that is being supplied. The basement is arranged to be used as a play room for the pupils, and is heated sufficiently by the steam mains and returns, which are left uncovered for the purpose. The toilet rooms or lavatories in the basement are provided with additional heating surface in the form of a coil arranged as shown, each presenting 48 feet of surface.

On the first floor direct radiation is placed in the main hall and direct-indirect radiators are used for heating the cloak rooms, which are also connected with the ventilating flues. On the second floor direct-indirect radiators are used in the cloak rooms and in the teachers' room, and the exposed piping running through the teachers' lavatory furnishes sufficient heat in that room. The third floor is heated entirely by direct radiation, and ventilation is secured by 24 x 36 inch Tuttle & Bailey registers connected with the main vent shafts, which are 48 x 60 inches in size. The vertical vent shafts at the front of the building are connected with the main vent shafts by means of vent ducts running underneath the floor of the third story,



as shown. These vent ducts are each 36 x 84 inches in size. The two lavatories in the basement are also connected with two separate vent flues provided for the purpose, these vent flues being placed so that one side is in contact

feet of surface, in the indirect radiators 3600 square feet of surface, and in the direct radiators 1444 feet, making a total of 5724 square feet. This is the actual surface exposed, exclusive of the mains. It is ordinarily supposed that

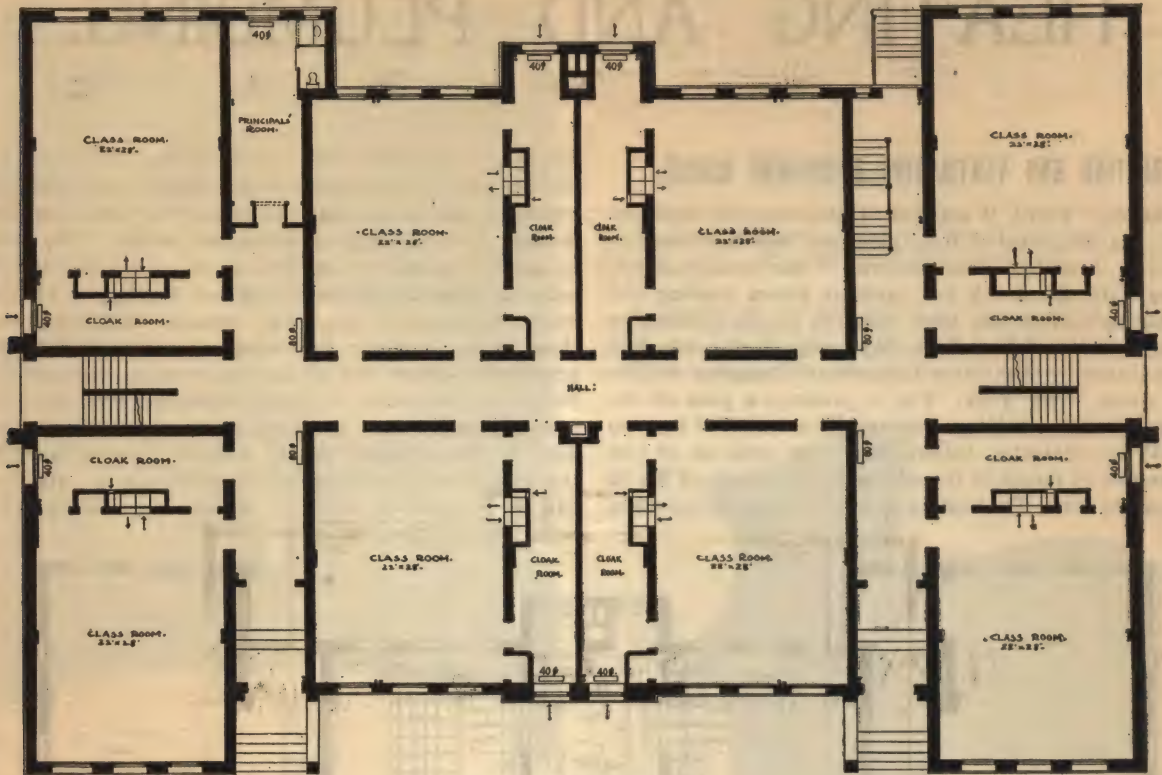


Fig 2.—First-Floor Plan

with the chimney, which heats them sufficiently to produce an exhaust current. The four radiators on the front of the third floor each expose 80 square feet of surface, while all the other direct radiators on this floor expose 76

direct-indirect radiation is an additional tax to the boiler over the actual direct surface exposed, and a fair estimate would be in this case that the direct-indirect surface was equal to 816 square feet of direct surface, and that the

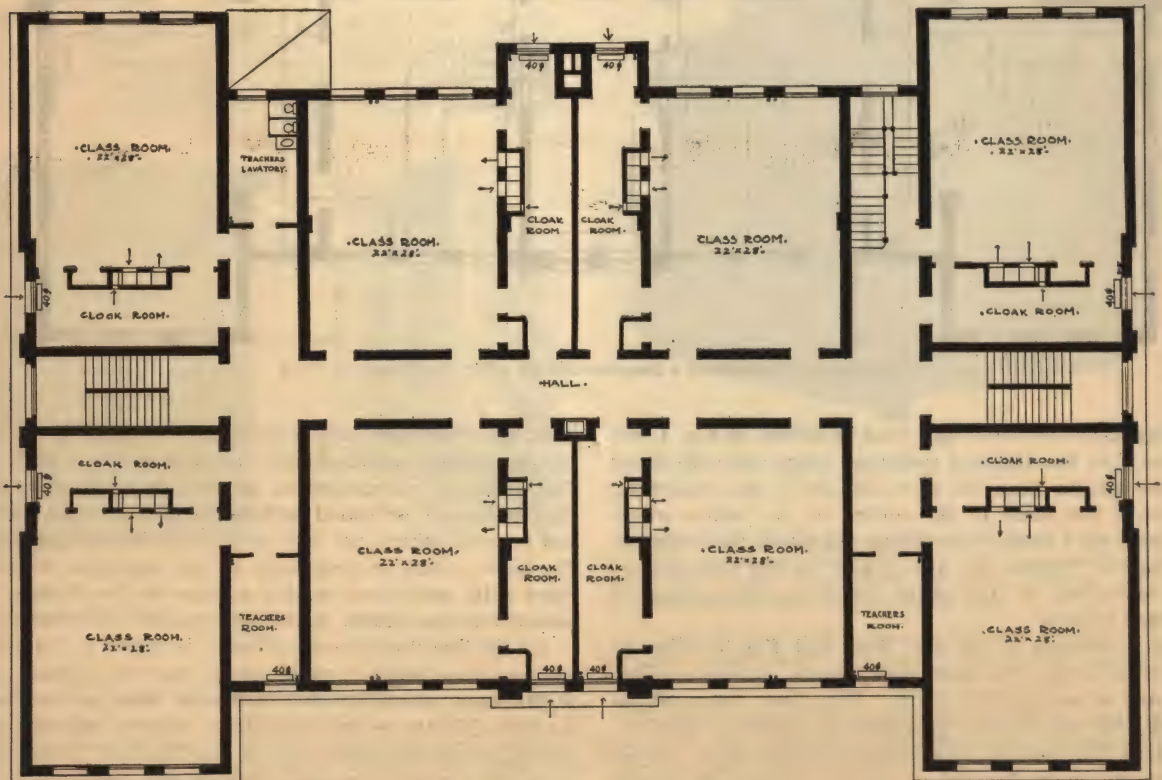


Fig 3.—Second-Floor Plan.

feet of surface. The direct indirect radiators used in the cloak rooms on the first and second floors and in the teachers' rooms each present 40 square feet of surface. There is exposed in the direct indirect radiators 680 square

indirect surface was equal to 5400 square feet of direct surface. When this is added to the 1444 square feet of direct surface it will be seen that the system exposed equivalently 7660 square feet of direct surface, exclusive



of the mains and the surface exposed by the coils in the vent shafts.

The two boilers used were specially constructed with a view to the heavy work that they had to perform, and were rated by the manufacturers to be capable of carrying 2700 square feet of direct surface each, or a total of 5400 square feet. Each boiler exposed 440 feet of fire surface, or a total of 880 feet. The boilers have been thoroughly tested during the past winter, and the successful heating and ventilating of the building has demonstrated their ability for much larger work than they were rated to be equal to. This high efficiency is said to be due to the side feed feature of the boilers, the boilers being provided with a grate of 40 inches diameter, but by the construction this does not give a correct idea of the fire surface or the amount of air which may come into the fire. The diameter of the fire pot at the point of combustion is 45 inches, but by the method of feeding the fire here employed a hol-

building and on the relief pipe from the supply riser. The Bundy Baker automatic air valve is used in connection with all radiators, and air lines run from each to the basement, where they terminate over a sink. Risers are covered with sectional covering to a point 6 feet above the floor for the protection of the pupils. The radiators and piping exposed in the school rooms are all finished in gold bronze.

### Gas Tied Up in Red Tape.

A Paris correspondent of the New York *Sun* describes the experiences of a Chicago woman and her two daughters who lived in the Americans' paradise for a winter, and among other things tells of the obstacles they overcame in getting the gas turned on in their apartments:

They wanted gas, so Mrs. Brown went herself to the company's office to subscribe for it and to say that she wanted it immediately.

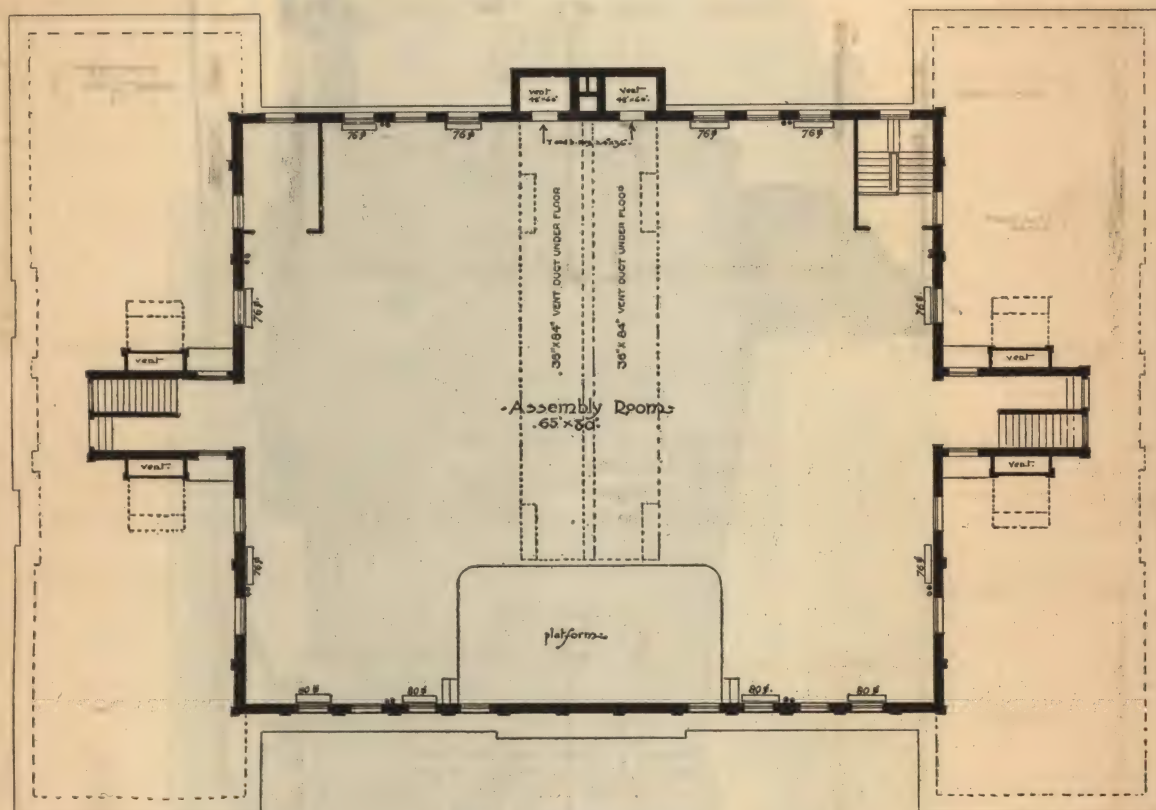


Fig. 4.—Third-Floor Plan.

low of incandescent fuel is formed, so that a much greater surface of fire is exposed than the area of a 45 inch circle. The boilers are provided with automatic damper regulators and automatic water feeders, the water feeders being arranged with by pass, so that the boiler can be fed direct when necessary.

The indirect stacks are placed in cases made of No. 24 galvanized iron, the casings providing 13 inches of air space above and 12 inches of air space below the radiators. The main cold air ducts are made of No. 20 iron and the branches of No. 22. The vertical heating flues are also lined with No. 24 galvanized iron and are painted on the outside before being placed in position. These heating flues run from the indirect stacks to a point 11 feet above the floor line of the rooms, where they discharge the warmed air. The vent flues are also made of No. 24 galvanized iron, and are provided with a register near the floor and also one near the ceiling. Ample provision has been made for expansion and contraction of all risers, and all mains have been relieved at points where necessary to aid the circulation. The steam connections to the indirect coils are  $1\frac{1}{2}$ -inch in each case and the returns  $1\frac{1}{4}$ -inch. A Jenkins valve is placed on the supply and a Kennedy gate valve on the return to all radiators. Valves are also placed on the supply and return risers throughout the

"You shall have it within the fortnight, madame," said the clerk.

"Can't I have it before that?"

"Not a day, madame. We have to obtain permission from the city before we can consider your application. Then we must also have another permit to put it in. These things require time, madame."

The following day the comptroller of the gas mains in that *arrondissement* made a call, with a portfolio full of papers to sign. An hour after he was gone the deputy comptroller arrived with three workmen, examined all the gas fixtures, called for pen and ink, sat down and wrote out his official report of the inspection, which he signed and called upon Mrs. Brown to sign. Then he took his workmen away. The same afternoon a boss plumber, notified by the gas company, came with two more workmen and made another inspection. Mrs. Brown signed an application for this plumber to examine the gas burners and pipes to see that there was no leak, and the next day three workmen came and spent the afternoon doing this. They wrote out a certificate to the effect that there was no leak, and gave Mrs. Brown a copy of it. There was an interval of two days; then the deputy comptroller arrived, alone, with another copy of the certificate and proceeded to check the work of the plumbers; he also made out a paper stating that there was no leak. On the same afternoon the boss plumber came back and checked the work once more. Again there was an interval, this time for a whole week, but bright and early on the eighth day the original comptroller made his appearance, his portfolio bulging with papers, and very important. He



spread out before Mrs. Brown nine separate documents, stamped, sealed, red-taped and covered with official signatures; some were white, some pink, some yellow; some consisted of but a single sheet, while others were small pamphlets; all however, bore the common brand of a Government revenue stamp, the denominations of which were from 2 cents to 50 cents. Mrs. Brown's total indebtedness for fees, including plumbing work, was 86 francs.

"Forty francs of this, however," the comptroller assured her, "you will get back when your subscription expires. It is merely a deposit."

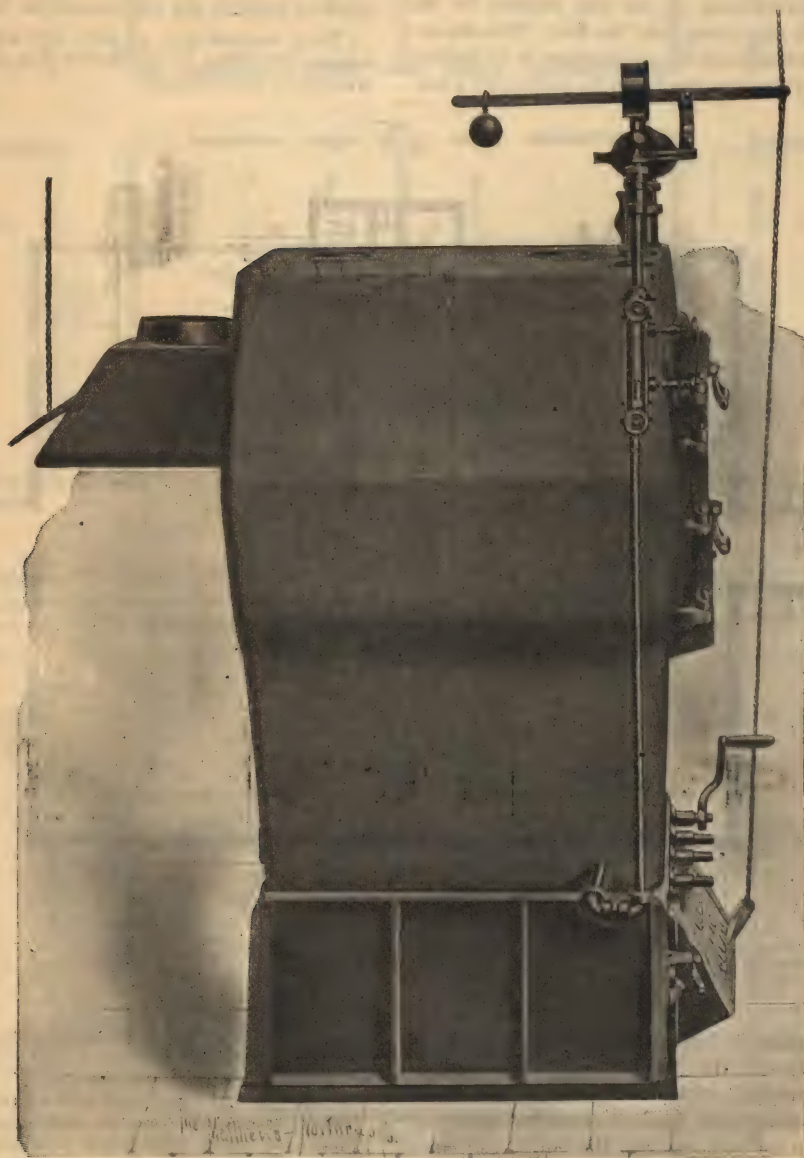
"A deposit for what?" asked Mrs. Brown faintly.

"Why, for the approximate amount of your first month's bill, of course," said the comptroller. "The deposit is always graduated according to the number of burners in the apartment."

in which the inspector was to write down the record of the monthly consumption. Then in the afternoon, resplendent in gold lace, an entirely new man came on the scene. With a dramatic flourish he broke the leaden seal with a chisel, and the gas was officially on!

### The Palace Regent Solid Safety Boilers.

Russel Wheeler & Son of Utica, N. Y., have developed a new type or pattern of heater, suitable for either steam or hot water heating, and designated by them as the Palace Regent safety solid heater. Fig. 1 gives a view of the external appearance of the heater as it is equipped for steam heating. It will be seen that the construction is best described by its name, as from the bottom of the fire pot to the top of the heater it is one piece work. In other



*The Palace Regent Solid Safety Boiler.—Fig. 1.—General View of Steam Boiler.*

Mrs. Brown counted out the 86 francs. Then the comptroller, seeing that she had never subscribed for gas in Paris before, good-naturedly explained:

"When your bill comes in at the end of the month you will have no trouble at all, because all the charges are tabulated. The first amount on the bill will be for the gas, the second for the amount of the Government stamp for the receipt, the third the rent of the meter, the fourth the charge for the maintenance of the street mains, the fifth that for the house main, the sixth that for the stop cock in the hall, the seventh that for the stop cock in the apartment, and so on. It is really very simple."

Three days after the appearance of this man two others arrived with the meter; following them was a plasterer to place it, and shortly afterward a plumber to make the connections. The meter was still locked and sealed with a leaden seal. Two days intervened, and Mrs. Brown was about to notify the main office, because she was tired of using lamps, and, anyhow, the two weeks had elapsed. On the next day a man arrived with a book

words, although the casting is subdivided into many parts, by water ways and flues, yet there are no joints, the whole by means of the cored work being made in one casting. The numerous advantages resulting from this are easily understood by those interested in these devices. The freedom from joints and constant possibility of leaks is certainly acceptable. The difficulty of this work cannot be understood until one becomes familiar with the internal arrangement, which is made clear by reference to Fig. 2, which shows a sectional view with the sides broken away. The manufacturers of this heater embody in all their designs a feature which they claim to be of great value. This is in directing the course of the products of combustion toward the front of the heater, and making one more travel the entire length for the products of combustion to make. In accomplishing this with the Palace Regent safety solid heaters the water ways are arranged to place thin strata of water in close contact with large flue areas and deep fire pots, a combination which, it is pointed out, must result most satisfactorily.



This heater was severely tested during the past season and its work, we are told, has been absolutely satisfactory, although it is not until now that it has been placed before the trade. A new catalogue devoted to this line will be sent to all who apply for it.

## PLUMBING CLASSES IN ENGLAND AND IN THE UNITED STATES.

BY THOMAS S. AINGE.

It is noteworthy that in England the plumbing fraternity are in advance of any other body of artisans in recognizing the aims and benefits of technical instruction, and have assisted largely in the building up of the present organized system for carrying it out systematically in all the principal cities and towns in the country. Evening classes for instruction in technological plumbers' work have been in operation upward of 17 years, and such in-

As representing the popular opinion, it has been authoritatively stated that "it is not the function of technical education, as understood in England, to teach trades, but rather to supplement workshop practice by a knowledge of scientific or artistic principles connected with certain industries," and while the plumbing classes and examinations have been and still are open to those not engaged in the plumbing industry, it is probable the instruction will, in the near future, be limited to those actually engaged as workmen, or who have had experience in the trade.

The complete course of instruction is divided into three grades, "Preliminary," "Ordinary" and "Honors," and embraces the following subjects: Workshop Arithmetic, including Mensuration; Mechanical Drawing, Elementary Science, including Chemistry, Mechanics, Hydraulics, Hydrostatics, Hydrodynamics, Heat and Electricity; Building Construction, having special reference



Fig. 2 —Broken View, Showing Construction.

struction is now generally recognized as a part of the ordinary training of the craftsman. The number of classes varies each year, but is steadily increasing. In 1896 there were 120 classes with 3194 students in attendance, and in 1897, 158 classes and 3533 students. Being well distributed throughout the country, the classes are within the reach of nearly every plumber and those who desire to qualify themselves in the principles of plumbing and sanitation.

### INSTRUCTION IN ENGLISH CLASSES.

The classes and examinations are mainly under the direction of the City and Guilds of London Institute for the Advancement of Technical Education, the work of instituting and conducting the classes and the supervision of the examinations being delegated to a "Local Committee" in each locality. The syllabus of subjects for instruction and the papers for examination for each class are prepared by the governing body at London, thus securing a uniform system of instruction throughout the country. A similar movement has been instituted by the Plumbers' Company, but the bulk of the classes are at present under the direction of the first named institute.

to roofs and the methods of making them water tight; Sanitation, including principally the water supply, sewerage, drainage, heating and ventilation of buildings; Gas Fitting, Specifications, General Plumbing and Workshop Practice.

To many the list of subjects will appear formidable, but it is not expected that the plumber will enter into a systematic study, in detail, of the subjects of Chemistry, Mechanics, &c., but that he shall acquire a sufficient knowledge of the laws and principles of these subjects in their application to his daily work, especially with reference to sanitation. To quote from a recent syllabus: "He should recognize the energy possessed by a moving body of water, and that the energy must be expended before the water can be brought to rest. He will then readily understand the effect of suddenly checking the flow of water in a pipe, and the application of the same principle to the hydraulic ram. The increase of pressure in front of a moving column of liquid and the diminution of pressure at the side and in the rear will serve to explain the difficulties met with when closets on several floors com-



municate with one stack of soil pipe. The idea of stream lines in a moving fluid can be easily grasped, and from it will follow all the well-known principles of joining pipes so as to avoid eddies and waste of energy, the use of trumpet mouths, of gentle bends," and so on.

In certain cases it may be required of a student in the Preliminary grade that he shall attend a two years' course of instruction in the subjects of a common school education before being allowed to proceed to the higher grades in technology. The practical instruction is designed principally to enable the student to properly bend  $1\frac{1}{4}$  to 4 inch lead pipes; to join lead pipes from  $\frac{1}{2}$  to 4 inches in diameter by wiped soldered joints, without the use of a lamp or gas jet, and in such positions as would occur in practice; to boss a piece of sheet lead to a given form, and to execute any other ordinary piece of lead work.

The fees for instruction and examination are nominal, and to those who satisfy the examiners in the entire course certificates are given designating the holder thereof as a practical plumber, or to that effect. Valuable money prizes and silver and bronze medals are awarded to those who obtain the first places in the examination. There is no age limit to the students attending the classes.

Commenting upon the courses of study which I have outlined, the Director of Technical Instruction for the County of Lancaster says: "The syllabus of instruction is specially adapted to apprentices in the plumbing trade, and its aim is to connect continuous and systematic instruction in the principles of science with the practice of plumbing, the instruction being spread over the entire period of apprenticeship, thus making the class work and actual training run, as far as possible, concurrently." In this connection it should be stated that in many parts of England the apprenticeship system still remains in force in the plumbing trade, and efforts are being made for a general revival of the time honored custom, but so far there is no progress to note.

#### SPECIAL CLASSES FOR TEACHERS

To meet the growing demand for competent teachers, special classes for the technical training of advanced student plumbers to qualify them for the position of teacher (or inspector) of plumbing have been instituted by the Plumbers' Company, and plumbers' workshops and a museum of plumbing, for the use of the students in these classes, have been fitted up under the direction of the veteran plumber, S. Stevens Hellyer.

In the operation of the plumbing classes many obstacles have been encountered, notably the lack of knowledge in the students of the principles of Geometry, Drawing, Elementary Physics and Chemistry, and in some cases of the elements of a common school education. The following extracts from the reports of recent examinations will serve to illustrate this point: "Very few of the candidates knew how to work a simple geometrical problem." "Very few appear to possess any knowledge of the most elementary principles of hydrostatics, and question 7 was in very few cases so answered as to show that the idea of water level was understood." "The candidates generally were unable to distinguish between temperature and amount of heat, and knew nothing of the pressure exercised by head of water, or the distribution of heat by convection, conduction and radiation." "Some persisted in stating that pipes burst at the time of thaw; many gave as an explanation of frost burst a diagram illustrating the change in volume of water between 0 degrees C. and 100 degrees C." "In bending a piece of waste pipe to a certain shape or pitch, they seem to trust too much to the eye, instead of setting out the exact thing on the bench and working to it, which would be the means of the piece of work fitting its intended position." "More than one advocated the use of a hydraulic ram in the question of raising water to a storage tank, overlooking the fact that the source of supply was a reservoir." "Two candidates made so flagrant a mistake as to write that 10 gallons of water could be contained in a cubic foot." "One thought that in working a pump two strokes per minute was quite sufficient, another that 55 might be got through without

discomfort, while the amount of water each stroke lifted was made to vary from about  $\frac{1}{8}$  pint to 8 pints." "Only one candidate put his main drain in question 2 as 6 inches, the others preferred 9 or 12 inches and one 15 inches." "One candidate very rightly said that in testing stone-ware drains with water no great head of water should be put upon them, while another would have the head of water not more than 40 feet." Over 60 per cent. of those examined in 1897 failed to obtain the required number of marks. As the candidates in these examinations were student plumbers, many of whom had received considerable class training, the question naturally arises, what would be the result of a similar examination of the vast army of plumbers who have not had the advantage of such class training?

#### SCHOOLS IN THE UNITED STATES.

In the United States at the present time plumbing is taught in 12 schools, all of which are located in the Eastern States, five of which are in the State of New York and four in New York City. They are as follows: New York Trade School; Pratt Institute, Brooklyn; Springfield Industrial Institute, Springfield, Mass.; Master Builders' Mechanical Trade Schools, Philadelphia, Pa.; Baron de Hirsch Trade School, New York; North End Union, Boston, Mass.; St. George's Evening Trade School, New York; Y. M. C. A. Institutes at Bridgeport and Hartford, Conn., and Scranton, Pa.; New York State Reformatory Trade School, and International Correspondence Schools of Scranton, Pa. About 540 students are in attendance at these schools, not including the two last named. The International Correspondence Schools have an enrollment of about 1000 students in the School of Sanitary Plumbing, Heating and Ventilation. Day classes are held at four and evening classes at eight schools, with fees ranging from \$7 to \$100 for the course. An average of nine schools shows that about four-fifths of the time during the course is devoted to manual and the remaining one-fifth to scientific instruction. Classes were formerly held at the Mechanics' Institute, Rochester, N. Y., and the Y. M. C. A. Institute, Bowery, New York, but were not a success.

As many of the schools before named have adopted a course of study somewhat similar to that of the New York Trade School, a brief description of the plumbing course of that school may be taken as fairly representative of the other schools. Day and evening classes are held, the day class consisting of a four months' course of instruction—manual and scientific—in plumbing and gas fitting, including also the drawing of plans. The manual instruction includes the wiping of joints in such positions as would be met with in practice, sheet lead work and the setting up of fixtures. The scientific instruction relates to the proper arrangement of service pipes, boilers, tanks, pumps and plumbing fixtures in general, and the arrangement, construction and ventilation of drain, soil and waste pipes. Diagrams of faulty plumbing are given to the students for correction. The evening classes are held on three evenings per week during six months in the year, two evenings being devoted to manual and one to scientific instruction. The last named classes have been more largely attended than any of the classes at this school.

#### ENGLISH AND AMERICAN SYSTEMS.

A brief comparison of the systems of instruction in both countries shows:

1. That in England the facilities for acquiring a plumbing education are many, the classes being distributed throughout the entire country and open to persons of all ages, and the fees nominal and nearly uniform; while in the United States such instruction can only be obtained in a few of the large Eastern cities, in many cases upon the payment of a considerable fee, and in the best schools the classes are limited to young men only.

2. That in England the classes are under the control of one governing body, thus securing uniformity of work, while in the United States the course of instruction is selected by each individual school, and though many of these have adopted the course of the New York Trade



School there is still a lack of 'uniformity in the subjects taught in each school.

3. That in England the instruction is mainly of a scientific nature—which is in keeping with the popular opinion respecting the aim and scope of technical education—while in the United States, as previously stated, a large portion of the time is devoted to manual instruction in the workshops of the schools.

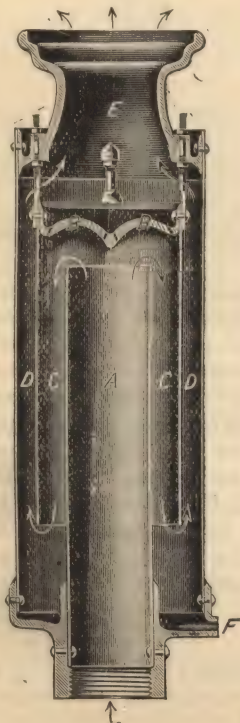
— Apart from the merits or demerits of either system—and each has its redeeming features when viewed from different standpoints—what is required at the present time is a system of instruction particularly adapted to the wants of those already in the trade, very many of whom, though skillful workmen, are lacking in the first principles of technology.

#### A SUGGESTION TO MASTER PLUMBERS.

The existing laws for the regulation of plumbing in this country, many of which demand an educational test of the plumber's ability to pursue his calling, together with the growing demand for an extension of State and municipal control of this work, render it necessary that the plumber of to day should be well versed in the principles of his calling. The National Association of Master Plumbers has, I believe, been instrumental in securing the enactment of many of the existing plumbing laws, and I would respectfully suggest that this association would confer a lasting favor upon the plumbers of this country by similar effort toward the establishment of plumbing classes in every city in the Union.

#### Bundy Exhaust Head.

The Bundy exhaust pipe head, which is illustrated by the accompanying engraving, is made by the A. A. Grifing Iron Company, at their works, Jersey City, N. J.



Bundy Exhaust Head.

They also have offices at 66-68 Centre street, New York; 177-179 Fort Hill Square, Boston, Mass., and 702 Arch street, Philadelphia, Pa. The head is made of heavy iron and is so constructed as to cause the steam in passing to change its direction three times without causing, it is claimed, any back pressure upon the engine. The three cylindrical shells of which the head is composed are placed one within the other, and each is of greater area than the one next inside, that full capacity be given throughout, with the element of friction added. The manufacturers point out that there is no crimping of the iron, with its incident weakening at the point where the scale is necessarily broken, and as a result the head is likely to be of long life without any liability of repairs.

#### Chicago Master Plumbers' Protective Association.

Quite a number of master plumbers in Chicago who do not belong to the Chicago Master Plumbers' Association have formed an opposition organization styled the Master Plumbers' Protective Association. The officers are as follows: President, C. Hudson; vice-president, R. J. Arnold; second vice-president, W. C. D. Gillespie; secretary, J. Wyman, 954 West Madison street; financial secretary, W. Wilkie, 705 West Madison street; treasurer, W. G. Coles, 194 South Western avenue. The members of the new association are principally plumbers having small shops, who claim that the cost of membership in the Chicago Master Plumbers' Association is a serious tax upon them, in addition to their city license fee and State examination. The agreement between the latter association and most of the supply houses, however, prevents the outside plumbers from obtaining goods in a regular way, and they are compelled to purchase through other channels at excessive prices. By organizing they think they may be able to compel recognition from the supply houses. The supply men have for some time been restive under the present arrangement, believing that they should be permitted to sell to all licensed plumbers whether they belong to an association or not. A knotty question may now be presented to them as to whether the new organization is not an association of master plumbers just as well as the old one, and therefore making its members eligible to their recognition.

#### Baltimore Master Plumbers' Mutual Protective Association.

We have received the following letter from George J. Thaler, 800 North Gay street, Baltimore, Md., first vice-president of the Master Plumbers' Mutual Protective Association:

Referring to your article in the issue of March 5, under Notes, page 45, you say that "arrangements were made whereby the members of the Master Plumbers' Mutual Protective Association can buy their materials at wholesale prices on the co-operative plan, the members agreeing not to patronize the Baltimore dealers." It is true, arrangements have been made by which members can purchase material at the right price, which all of them cannot do from the local supply houses, and the names will be given to any member who will apply, but he will not be served on the co-operative plan, neither has any one officially agreed or even said that he would not patronize the local dealers. What our members say or do individually is their own business, and must not be laid at the door of the association. It is to be hoped, however, that the local houses will soon see the folly of their ways and come into line by and by, and sell any plumber in business at the right price, whether he is a member of the local branch of the National Association or not. Just now the dealers will sell only such as are members of the National Association at anything like a fair price, and when they do condescend to take an outsider's money he pays more than fair for his material and always has to pledge himself not to tell from whom he bought the goods. To my way of thinking that is degrading to a free man, and it appears very strange that such a condition of affairs can exist in a free country, and that a body of shrewd business men like the manufacturers and jobbers of plumbing material would allow retailers, and in many cases men of very poor business qualifications, to outline their business policy for them. There are in the Baltimore city directory about 400 names of plumbers and stove men who do plumbing. Perhaps one-fourth of them are members of the local branch of the National Association in "good standing" (that means who pay their dues). Heretofore these gentlemen had things very much their own way regarding prices, the interpretation and administration of the local laws, &c., much to the disadvantage of others following the same line of trade, but who for reasons best known to themselves did not elect to become members of the local branch of the National Association. There is no reason why obstacles should be thrown in the way of the



plumbers and such who are not themselves plumbers, but who employ good, reliable mechanics who have their certificate from the Board of Examiners, just because they are not members of that august body "the local branch." It is but fair that the profit on material should go to the plumber, and that the supply houses protect the plumber, also that the laws governing the erection and maintenance of work be rigidly enforced, but it must be done fairly and impartially, and without discrimination or bias. And that has not been done in our city for some time, and it is high time that a beginning be made to abolish existing evils and bring about a more fair treatment for all, and that was the object in forming the Master Plumbers' Mutual Protective Association.

### NATIONAL DELEGATES.

The convention of the National Association of Master Plumbers at San Antonio, Texas, this year will be held April 12, 13 and 14, which is two months earlier than usual, heretofore the annual convention having been held in June. This will make it necessary for the association officers to collect dues from members earlier than usual and pay the per capita tax so as to be able to elect the number of delegates to which their associations may be entitled. Only about a month now remains for this work and the election of delegates, and it should receive prompt attention. Already some cities have attended to this business, as the following will show :

#### PITTSBURGH DELEGATES.

A letter received from Secretary George Sands informs us that at the regular meeting of the Master Plumbers' Association of Pittsburgh and vicinity, held at the Pittsburgh Builders' Exchange March 4, the following delegates and alternates were elected to represent this association at the National Convention at San Antonio, Texas, April 13, 1898 :

*Delegates :* John M. Addy, J. J. Kenedy, F. J. Geery, George Addy, Frank McKnight, James Bowman, Thomas Chipp, John Cowling and D. G. Deeley.

*Alternates :* Charles S. Craig, Frank Tanigan, R. Carson, R. Gould, F. P. Blythe and J. O. McGinniss.

#### NEW HAVEN DELEGATES.

At the meeting of the New Haven Association of Master Plumbers held Tuesday, March 1, the following delegates were elected to attend the National Convention at San Antonio, Texas, on April 13 : S. E. Dibble, Andrew J. Clerkin, W. H. Hasell, T. A. Potter and Daniel M. Sheehan.

### New York State Plumbers.

The convention of the New York State Association of Master Plumbers was held at Binghamton, N. Y., this week, and was called to order by President W. G. Reid of Rochester, N. Y. After transacting the regular business Auburn was selected as the place for holding the next convention and the following officers were elected :

*President,* Horace F. Westcott, Albany.

*Financial and Recording Secretary,* John E. Dugan, Albany.

*Treasurer,* A. H. Brown, New York.

*Delegates to State Convention :* B. J. O'Donnell, Syracuse ; W. H. Barnes, Troy, and George Cropper, Binghamton.

### Minnesota Examining Board.

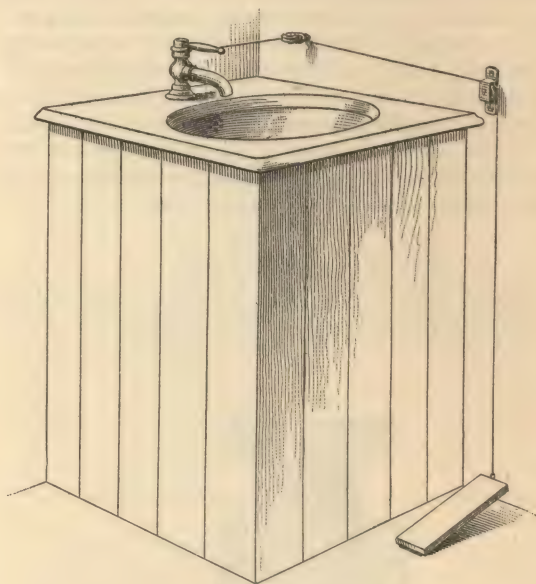
The Minnesota State Board of Commissioners of Practical Plumbing will hold examinations for masters and journeymen plumbers at St. Paul, March 21 and 22, and at Minneapolis, March 23 and 24. This will be the first examination that was ever held under the State law where the master plumbers will have to undergo an examination.

There is considerable uneasiness manifested among the master plumbers as to the outcome. As in other cities, notably Milwaukee, about one-third of the masters fail to pass. Secretary Harrington says that the examination will be theoretical and practical, and that the master or

journeyman who fails to pass a satisfactory examination will be compelled to give up the business, as the board are of the opinion that the law must be lived up to.

### A Convenient Lavatory Attachment.

All who have used lavatories where self closing faucets are supplied have been more or less annoyed by having to wait for water to flow into the bowl when only a small amount of washing is necessary. All prefer to wash under running water where the water supply does not make strict economy necessary. There is a difference of opinion as to the amount of water that is used by washing under running water and by letting sufficient water run into the bowl to do the washing. In the lavatory used in one of the departments of the Wilmot & Hobbs Mfg. Company, Bridgeport, Conn., the method of overcoming the delay caused by a self closing faucet is shown in the illustration presented herewith. A small chain is attached to the lever of the faucet and runs across the slab to a pulley, where a turn is made and connection with



A Convenient Lavatory Attachment.

another pulley which lets the chain drop down to the floor, where it is attached to a light lever or foot treadle, the treadle being hinged to the floor at the other end. The treadle and the general arrangement is such that the spring in the faucet lever is sufficient to close it just as soon as the weight is taken from the treadle at the floor. When any one wishes to use the lavatory, by placing a foot on the lever the water continues to run until the ablutions are completed, and if it is desired to fill the bowl while the cuffs are being removed and preparations are being made for washing, it is easy to place the foot on the treadle and let the water run.

### NOTES.

An advance of 10 per cent. in the price of Range Boilers will, it is believed, confront the plumber in buying in the near future, and it is probable that the price of Brass Bibs and Brass Goods will make a movement in the same direction.

At the recent meeting of the Soil Pipe manufacturers the desirability of getting a better price for the goods was thoroughly discussed and a strong disposition to that end manifested, which has resulted in a uniform discount to jobbers, and where low prices had been made the quotations have been withdrawn.

J. M. Kaspers, Sheldon street, Houghton, Mich., is making extensive improvements in his plumbing establishment.

At a recent meeting of the Steam Fitters' Union, composed of steam fitters in Pittsburgh, Allegheny and vicinity, it was unanimously decided to make a demand for \$5.50 per day of nine hours, to take effect April 1.



Articles incorporating the Master Plumbers' Association of the District of Columbia have been filed with the Recorder of Deeds at Washington, D. C. The incorporators are William Koch, Henry J. Allen, George F. Schaffer, Edward J. Hannan, Daniel Hannan and Charles E. Barrick.

Vulcabeston is described in a pamphlet by the H. W. Johns Mfg. Company of 100 William street, New York. It is composed of asbestos, india rubber and other vulcanizable gums combined with materials for special requirements. It is valuable for steam packings, electrical insulators, &c., on account of its permanent resistance to heat and immunity from injury by acids, gases, moisture, &c. It can be made in any desired form, is practically indestructible, will not shrink, expand or warp. Two kinds are made—viz., for electrical insulation and for steam packing, &c.

Among recent new incorporations is that of the Self Lighting Gas Burner Company of New York City, with a capital of \$5000. The directors named are Max Spier, Percy Jacobs and E. S. Ullmann, New York City.

The Sanitary Committee of the Columbus, Ohio, Board of Trade held an important meeting recently and effected an organization, electing Dr. Otto Arnold chairman and George Dun secretary. Dr. Barbour, a member of the committee, called attention to the urgent need of public water closets in Columbus. The city is trying to secure conventions, is securing a great many, said he, and it is urgent that immediate action be taken on this matter. A special committee, consisting of Dr. Arnold and Mr. Wells, was appointed to investigate the problem as it has been solved in other cities and to report the results to the City Council for their action. Dr. Arnold is to investigate the system in Cincinnati and Mr. Wells that in New York.

C. N. Camp of Hull, Camp & Co., 129 Worth street, New York City, returned this week from a trip through New England in the interests of their specialties and the Cleavauc Air Valves, the Scaif Boilers and their Wrench for radiator unions. Mr. Camp reports the condition of trade to be quiet, but was fortunate in securing some large stock orders.

Joseph F. Moore of the Monitor Iron Works, manufacturers of Soil Pipe and Fittings, at Worth and Centre streets, New York City, is about to enjoy a vacation on the coast of Georgia.

W. E. Newman, Hillsboro Center, N. H., is making a fine display of Sanitary Plumbing in his show windows. Brass and Nickel Plated Piping is used and the mechanical work reflects credit on the workman.

Benjamin C. Smith & Sons of New York have been incorporated to carry on a Plumbers' Supply business, with a capital of \$10,000. The directors are B. C. Smith, B. E. Smith and F. A. Smith of Brooklyn. The new company have moved their business to the opposite side of Pearl street from their old stand, and they are now a few doors nearer Beekman street.

The City Council of Toledo, Iowa, have adopted an ordinance requiring the use of water meters, and those who wish to use city water must make application for a meter before May 1. The meters will be furnished at the city's expense.

The Ogden Plumbing Company of Fort Wayne, Ind., have gone out of business, the stock and material having been purchased by Emmett Martin.

The Ohio Brass Company have purchased the plant of the Mansfield Buggy Works, at Mansfield, Ohio, and are placing machinery and making the necessary changes to occupy the plant May 1.

Rankin & Kellogg, architects, 1024 Walnut street, Philadelphia, Pa., have been awarded the contract to prepare plans and specifications for a new post office building, to be erected at Camden, N. J., at a cost of \$150,000, which will have a complete system of steam heating and ventilation and a plumbing system. The Hon. Adam Clark Smith of Camden will be superintendent of construction.

The City Council of Omaha, Neb., have appointed Charles H. Kessler, a master plumber, and W. E. Thatcher, a journeyman plumber, as members of the board for the examination of plumbers.

A fire recently occurred in the establishment of L. B. Hartung & Co., plumbers, Canton, Ohio, in a building owned by President McKinley, doing a damage of \$2000 to the stock and \$1000 to the building.

George Neilsen has leased a storeroom next to the Weber Hotel, on North Main street, Pittston, Pa., for a plumbing shop.

A committee composed of Henry F. Peck, Andrew Shiland, Jr., Frank C. Warren, P. N. Welch and William

H. Hart, representing the stockholders of Peck Brothers & Co., New Haven, Conn., held a meeting Friday, March 4, for the purpose of forming plans for the reorganization of the company.

Forest Hooper of Woburn, Mass., has erected a building for the manufacture of his Patent Ball Cock, Patent Clean Out and other articles of interest to the plumbing trade, and for the use of his plumbing business.

John Porsch, Erie, Pa., announces that for 30 days only he will send two of Porsch's Molded Wiping Cloths instead of one for a dollar, just to introduce them. The working surface of these Cloths is made of fine mole skin or herring bone ticking, as the purchaser may desire. The Cloths are used to wipe joints on any size of pipe from 1/2 to 4 inches.

John Sullivan, a plumber, formerly in the employ of Van Vergell & Co. of Carbondale, Pa., has entered the plumbing business and set up a shop for himself.

The Helios Carbide Specialty Company of Philadelphia, Pa., are erecting a large factory at Pleasantville, N. J., for the manufacture of Brass Specialties necessary for the use of carbide gas.

At the regular meeting of the Master Plumbers' Association of Worcester, Mass., it was voted to secure quarters in the Builders' Exchange as a place for holding meetings and storing the properties of the association.

A. S. Reed has purchased the Pump and Plumbing establishment of C. F. Monroe, on Main street, Vincennes, Ind.

Benz Brothers, Reading, Pa., have purchased a lot, 19 x 115 feet, and will erect a shop and storeroom for their plumbing business. The building will be 19 x 80 feet and three stories in height. The rear of the lot will be used for a warehouse and stable.

George B. Barron has accepted a position as a salesman with the plumbing supply house of Smith & Webster of Chicago.

Charles Young has been elected city plumber of Alston, Mass., by the Board of Water Commissioners.

Wiltis F. Wolfe, president of the American Society of Heating and Ventilating Engineers, informs us that the bill for compulsory ventilation passed the Senate of New York State, at Albany, on Tuesday.

The B. F. Sturtevant Company, Boston, Mass., have been awarded the contract to install Heating and Ventilating Plants in the new buildings for the Pennsylvania Institution for the Instruction of the Blind, now in course of erection at Sixty-fourth and Malvern streets, Philadelphia, Pa. The cost will be \$60,000.

Tucker & Koester, 116th street and East River, New York City, are making a specialty of manufacturing Incandescent Mantels for use with Westbach burners. Speaking of the special merit of the Mantels which they make, they allude to the improved machinery which they employ on the work and the excellent material. They also point out that their Mantel and Hood is hung over the burner with an asbestos loop.

A new Plumbing, Tin and Stove business is soon to be established in Malone, N. Y., Frank H. Monaghan and James J. Rice of Johnstown having formed a partnership for conducting such a business. The name of the firm is Monaghan & Rice and the business will be conducted in the vacant store on East Main street.

J. B. Moyers and Charles Mollart, plumbers, who have been in the employ of Cleaver & McCarter, have decided to leave Dubuque and go into business for themselves at Decorah, Iowa.

Owen H. Jones, Hartford, Conn., informs us that he has established his rights in a suit before Judge Shumway, sitting in the Superior Court, at Hartford, to patents for the Ball Cock which he is manufacturing, and which has already won a good reputation among the plumbing trade.

Sheahan & Groark, plumbers, of State street, New Haven, Conn., have purchased from the heirs of the Boardman estate the land and the nine-story building at 289 and 291 State street and immediately adjoining their present quarters. The purchase price was in the neighborhood of \$15,000. The purchase was made necessary by the increasing business of the firm, and it is the intention to refit the building and convert it into a first-class plumbing establishment. Among the possible changes is the raising of the structure two stories.

The Beery Heating Company, Baltimore, Md., have been incorporated by Otto Bruggeman, William A. Beery, Ira Plumley, Joseph C. Hobbs and James E. Tippet, with a capital stock of \$5000.

Henry F. Meyer will go into the plumbing business with J. C. Jahn, at Fort Wayne, Ind.



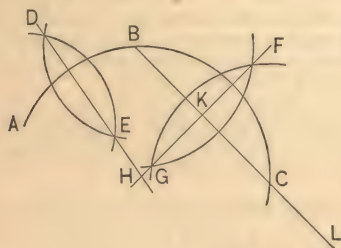
# SHEET METAL WORK.

## THERE IS NO NEW THING UNDER THE SUN.

The following letter from A. C. Smith, Camden, N. J., is of more than usual interest, especially to those who care to learn how they did things centuries ago. The revelations of explorers in the East are extraordinary, and, as our correspondent points out, records are brought to light which show that there were men living several thousands of years ago who did many things in pretty much the same way as they are done to-day:

We have been taught to believe that Tubal Cain was the first known cunning workman in metals. He was called by the ancients a furbisher of every kind of vessel and instrument of copper and iron, but by recent discoveries, made under the direction and expense of the University of Pennsylvania on the supposed site of the ancient city of Nimrud, in Assyria, where four cities, one beneath the other, have been uncovered, it would appear that he was not the first in his trade. Among the many wonderful things found in this last city is a coppersmith's shop, the books of which are in perfect condition, they being clay tablets, on which are printed, in cuneiform characters, the history as well as the accounts and contracts of the establishment, besides many curious diagrams, rules and problems. From them we learn that this business was handed down from father to son for 32 generations. The original was one Ham-yan, a Cushite, who flourished 4763 years before Tubal Cain. We are informed that he was acquainted with all the inventions and discoveries of his times.

Through the kindness of Dr. Pepper, Provost of the University of Pennsylvania, I have been permitted to examine copies and photographs of these curiosities, and as many of them will no doubt prove interesting to your readers, I (in acknowledgment of past favors in the way of information received through your valuable paper) take the trouble to forward you a description of some of them. In the first place is a photograph of a machine which resembles in a surprising degree a Robinson cornice brake. I am informed that it is about 4 feet long and made of bronze metal. This, as with all other finds, was turned over to the Turkish Government under agreement.



To Strike a Circle through Three Points.

We find here a rule to strike a circle through any three points not in a straight line, thus: Strike indiscriminately with one leg of the compass three points, as A, B, C; set the compass three-quarters of the distance of A B and strike from the points A and B the double arc D E; repeat between B and C; draw lines through the double arc D E and F G and extend until they intersect at H. Then H will be the center and H A will be the radius of a circle that will pass through the points A, B and C. If the compasses are not at hand the same result may be secured by the common square, thus: Draw a line from B through C indefinitely to L. Bisect B C at K. Place the point of the square at K and the edge of the tongue along the line

K L. Now draw a line along the edge of the blade from K to H. Treat the other side in the same manner. Where the lines intersect at H will be the center and H A the radius. It is plain that the center from which a segment has been struck may be found in like manner; also where the chord and rise of an arc have been given. Therefore this rule may be of some consequence to "E. M. B." of Celina, Ohio. (See page 31, *The Metal Worker*, February 5.)

To find the circumference of a circle multiply the diameter by 22 and divide the result by 7.

To find the circumference of an ellipse multiply one-half the sum of the two diameters by 22 and divide by 7.

To square a circle multiply the radius by one-half the circumference.

To find the surface of a cone multiply the side or slant height by one half the circumference of the base.

To find the surface of a sphere multiply the diameter by the circumference. This rule results in more than the actual measurement, but is nearer correct than the answer given "A. T. S." of New Jersey on page 28 of *The Metal Worker*, February 12, which was 82 5-10 square feet for a quarter sphere, one semicircle measuring 18 feet 9 inches, the other 17 feet 6 inches, with an altitude of 5 feet. This, according to the above rule, gives 93 3/4 square feet. If we measure this quarter sphere by triangles and allow for arcs on side and base we get 92 1/4 square feet, as follows: Multiply one-half the circumference of one semicircle by one-half the other—that is, multiply 9 feet 4 1/2 inches by 8 feet 9 inches—this gives 82 square feet. Now add 12 1/2 per cent. for arcs and we have the 92 1/4 square feet, and this is as near correct as can be calculated.

These ancients were undoubtedly acquainted with the principles of the voltaic pile, as one tablet cautions against using copper in connection with certain other metals for water vessels or cooking vessels, explaining that by certain laws the stronger would destroy the weaker metal. And here we find that the theory of the survival of the fittest is somewhat older than Spencer.

For the last 700 or 800 years every tinsmith, at home and abroad, has witnessed the effect of a copper bottom on a tin boiler, and knocked off these bottoms and replaced them with tin, without ever considering the cause of the effect. While I was an apprentice I made a tin boiler with a sunk copper bottom for a barber to heat his shaving water in. He was making at this time a patent hair restorer of a reddish color. He said to me on one occasion: "This boiler heats the water all right, but at times I don't know whether I am drawing shaving water or hair restorer." Some time after this, and before the water back came into vogue, I fitted up a laundry by placing a copper coil inside of the cylinder of an old heater and conducted the hot water therefrom to the stationary tubs by means of galvanized iron pipes. This gave an abundance of hot water, but in many instances the white clothes were ruined by iron rust. Remembering the barber's boiler, I at once tore out the galvanized iron and replaced it with lead pipe, and this worked like a charm. I am afraid, however, that "Plumber," Pennsylvania (page 31 of *The Metal Worker*, 19th inst.), cannot get rid of his trouble in this way on account of the iron water back. He will have to replace the copper boiler with an iron one.

They (the ancients) also understood the principles of expansion and contraction of metals, and must have had some knowledge of the principle of capillary attraction, as we find rules for the construction of copper gutters and valleys, which ought to be of some use to "C."



Mansfield, Ohio, but I fear that my letter will now occupy more space than it merits.

### Sheet Manufacturers' Association.

A meeting of the Board of Directors of the Association of Iron and Steel Sheet Manufacturers was held in the Conestoga Building, Pittsburgh, this week. The old officers were re-elected for the ensuing year, as follows: J. G. Battelle, Piqua, Ohio, president; W. T. Graham, Bridgeport, Ohio, vice-president, and John Jarrett of Pittsburgh, secretary and treasurer. No other action of importance was taken.

### Baker's Eave Trough Hanger.

The accompanying illustrations show Baker's eave trough hanger, made by J. R. Baker & Sons Company, Kendallville, Ind. Fig. 1 shows the hanger separate, and Fig. 2 shows a section of eave trough supported by them. The simplicity of the hanger will be readily seen, as it consists of a cross bar and roof straps composed of hoop steel, while the strap which goes round the under side of the trough is of galvanized iron. The parts are thoroughly riveted together, as shown, making, it is claimed, a very substantial article. While it is very readily attached to or removed from the trough, it is claimed to be impossible for the hanger to work loose, there being no bolts or nuts either in its construction or fastening to the trough. The only tool required for putting the hanger in



Fig. 1.—The Hanger Separate.

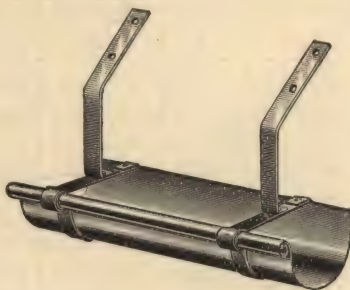


Fig. 2.—Supporting Section of Eave Trough.

Baker's Eave Trough Hanger.

position is a small pair of pincers for closing the eye of the hanger around the bead of the trough, and these pincers are furnished by the manufacturers free with the first order. These hangers are especially recommended for repair work because of the convenience and ease with which they can be put on without taking down the trough. It is furthermore pointed out that there is nothing about the hanger to cause any obstruction in the trough checking the flow of water. The roof straps are of eight different lengths, and the pitch of the trough can be easily regulated. The goods are put up in gross boxes and are furnished for any size trough with either one or two beads.

### Peck, Stow & Wilcox Co.'s Catalogue.

The Peck, Stow & Wilcox Company, Southington, Conn., and 27 Murray street, New York, have just issued a complete illustrated catalogue of their goods. In size it is about the same as their 1890 book, but an effort has been made to still further condense and group analogous goods. In the front is a page on which is shown views of their five factories at Southington, Plantsville and East Berlin, Conn., and Cleveland, Ohio. The first section of the book for 130 pages pertains to Tinners' Tools and Machines for hand and power, many new goods being shown, and is followed by Tinners' Material. Next in order are Mechanics' fine Tools, many new patterns of standard goods and other articles entirely new appearing. The balance of the book, there being 487 pages in all, contains Builders' and House Furnishing Hardware, Scale Beams, Meat Cutters, Coffee Mills, Casters, Stationers' Hardware, Carriage Bolts and a multitude of goods in the way of staple lines long made by them.

The G. Drouve Company, Bridgeport, Conn., have completed a Skylight to go to Guadalajara, Mexico, which measures 40 x 45 feet.

### FLASHINGS.

The demand for Sheet Iron continues excellent, and exceeds in volume anything in the experience of the manufacturers for years past. All the mills are well employed for some time to come on orders for both Black and Galvanized Sheets. Several concerns who are operating to their utmost capacity are unable to fill orders as fast as desired, and a number of manufacturers are reported to be considering the advisability of materially enlarging their plants. Mills rolling Sheet Bars have also booked a very large tonnage recently, deliveries in some cases running for the entire year, and it is reported that one or two makers of Bars are now practically out of the market. Consequently prices are stiffer all around.

The Chautauqua Hanger Company, Mayville, N. Y., issue circulars illustrating and describing the Chautauqua Eave Trough Hanger of their manufacture. It is a very simple device which can be easily applied and requires no tools to apply it, while neither solder, bolts or nuts are used in the construction or in the fastening. It is specially recommended for repair work, and it is further pointed out that being fastened to the back of the trough it does not jamb the bead, and is so constructed that it will not in any way check the flow of water. In the circular sent out by the company a number of signed and dated testimonial letters speak in the highest terms of the merits of this style of Hanger. They are made for tin trough from  $3\frac{1}{2}$  to  $5\frac{1}{2}$  inches, and for galvanized iron from  $3\frac{1}{2}$  to 7 inches. In the former case for  $\frac{1}{8}$ -inch bead and in the latter for  $\frac{5}{8}$ -inch bead.

A press report from Carlisle, Pa., says that a company of London capitalists have purchased a large tract of land in the vicinity of Carlisle, from which it is expected good Slate material for roofing can be procured. The product of the quarries, it is said, will be shipped direct to London wharves.

The Reeves Iron Company, Canal Dover, Ohio, manufacturers of Merchant Bar Iron, Black and Galvanized Sheets, are making some additions to their equipment which will considerably increase their capacity.

The Ferracute Machine Company of Bridgeton, N. J., manufacturers of Presses and Dies, have recently added a large erecting shop and have placed in it new machine tools, cranes, &c. They keep a force of pattern makers at work who are constantly making new styles and sizes of Presses. They have been building Presses for the Jeffrey Mfg. Company of Columbus, Ohio, for making their Elevator Buckets, Conveyors, &c. They have paid special attention to their line of Drawing Presses, and have obtained most excellent results in producing deep and difficult shapes in thin metals.

### The Philadelphia Exposition.

The Committee of Fifteen for the organization and general supervision of the Exposition of the Manufactured Products of the United States to be held in Philadelphia during 1899 has been appointed by the president of the Philadelphia Exposition Association, P. A. B. Widener. This Committee is the result of action taken at a recent conference of the committees representing the Philadelphia Museums and the Franklin Institute, at which time it was recommended to the exposition that the museums, the institute and the association should each nominate five members to represent them on the committee. The result of this action is as follows:

Nominated by the Philadelphia Museums.—Dr. William Pepper, president of the Philadelphia Museums; Dr. William P. Wilson, director; Sydney L. Wright, treasurer; William Harper, chief of the Bureau of Information; William M. Watts, secretary.

Nominated by the Franklin Institute.—John Birkinbine, president of the institute; George V. Cresson, James W. Dodge, Henry R. Heyl, first vice-president; Mr. Garrett.

Nominated by the Exposition Association.—P. A. B. Widener, president; William L. Elkins, vice-president; W. W. Foulkrod, vice-president; Justus C. Strawbridge, chairman of the Finance Committee; Theodore N. Ely, chief of motive power of the Pennsylvania Railroad.

The Michigan State Board of Arbitration met at Detroit on the 2d inst. and reviewed the testimony taken in the matter of the strike of the riveters employed in Wheeler & Co.'s shipyard at Bay City. The board's verdict is that the 1897 rate be paid to all employees, and the riveters' and setters' wages to be \$2.50 for a ten-hour day. The rate offered by the company was \$2.25, but both sides had agreed to stand by the result of the arbitration.



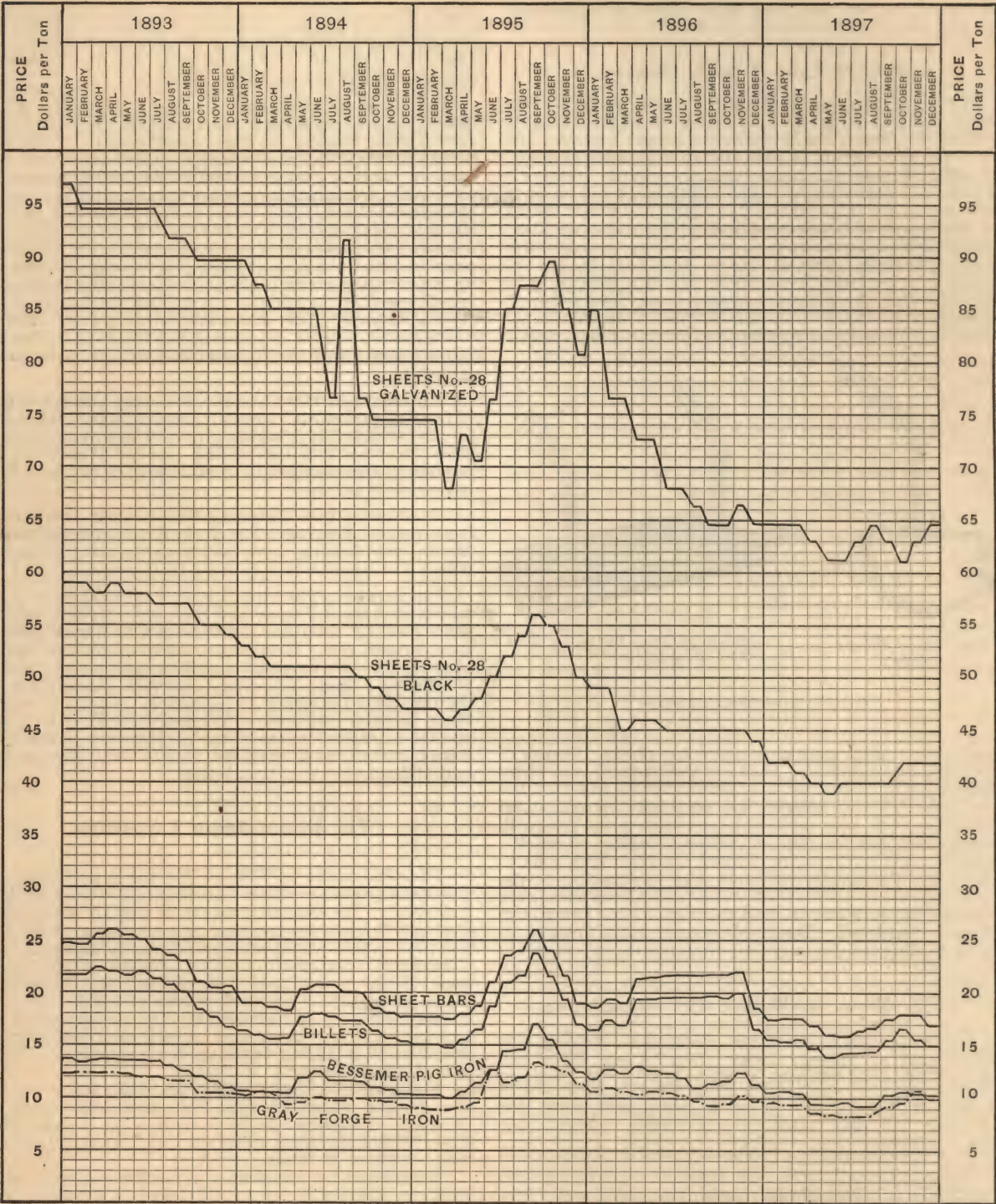
Fluctuations in the Prices of Sheets.

The Association of Iron and Steel Sheet Manufacturers has compiled an interesting diagram showing the fluctuations during the last five years in the prices per gross ton of black and galvanized sheets and tin plate bars. There has been added to the series the fluctuations in the prices of steel billets, Bessemer pig and gray forge at Pittsburgh.

It will be observed how close is the parallelism of the

Company, Jersey City, N. J. A quotation from "The Merchant of Venice" is added: "His scepter shows the force of temporal power."

We learn that "Wright's Trade Directory and Gazetteer," published by George Wright, 121 Fulton street, New York City, is now being compiled for the fifth edition, the first having been published in 1880. This work embraces Australia, India, China, Japan, Central and South America, West Indies, South Africa and Mexico, listing the business men of those countries ac-



FLUCTUATIONS IN PRICES OF SHEETS, SHEET BARS, BILLETS AND PIG IRON.

lines between the crude and finished material, subject, however, to a gradual approach, which shows that the "spread" between bars and sheets is decreasing. This is particularly noticeable in the case of galvanized sheets.

Gurden Corwith, metal broker, has removed his office from 101 Beekman street to 59 Maiden lane, New York.

The King of Clubs, holding a Dixon pencil, illustrates the March calendar issued by the Joseph Dixon Crucible

cording to their occupations and containing much information about distances, routes, &c., together with the tariff of the different countries. Each country is printed on a different color of paper and copious indexes are given, making reference easy to the contents. The publisher calls the attention of American manufacturers and exporters to the value of Wright's Directory in bringing their goods to the attention of foreign buyers.

The Central Iron Works, Quincy, Ill., will build a hydraulic elevator for the Government building at Pueblo, Colo.



# STOVE TRADE NOTES.

## Isaac A. Sheppard.

It is with regret that we chronicle this week the death of another veteran member of the stove trade of this country. Isaac A. Sheppard, head of the firm of Isaac A. Sheppard & Co., Philadelphia, died at his residence, 989 North Sixth street in that city, on the morning of March 6. The immediate cause of his death was heart failure. For many years he had been in failing health, and toward the end of last winter became confined to his house. He suffered from no disease in particular, his breakdown being attributed entirely to habitual hard work, in which he indulged almost to the end.

Mr. Sheppard was born in Cumberland County, N. J., July 11, 1827, and was a member of a very old family, his ancestors having formerly settled in Connecticut, but removed to New Jersey in 1696. The only educational facilities falling to his lot were those afforded by a country school, with sessions three months in the year. At 11 years of age he was thrown upon the world to earn his own living. A year later he went to Philadelphia and became an apprentice in the foundry of Warnock & Leibrandt. He was a most diligent apprentice, applying himself to his trade with that earnestness of purpose which was to be his great characteristic through life. During his apprenticeship he devoted his spare time to improving his education, and being studiously inclined he made the best of the opportunities presented by a residence in a large city. As a molder he enjoyed the enviable reputation of being the best in the land. Some of the feats of work he performed when a young man are to this day considered remarkable.

In 1859 he started in business for himself, establishing the Excelsior Stove & Hollow Ware Foundry, under the present firm name of Isaac A. Sheppard & Co. The business prospering, he in 1866 established the large branch foundry operated by the firm in Baltimore, Md. Under his watchful care the business grew to its present magnitude, the active management, however, during recent years devolving upon his sons.

Mr. Sheppard was in every sense of the word a public citizen, and was active in religious, financial, educational and benevolent enterprises. He served three terms in the Pennsylvania Legislature, in the years 1859, 1860 and 1861. At the breaking out of the War of the Rebellion he was chairman of the Committee on Ways and Means, and drafted the bills under which the Pennsylvania Reserves were raised for the defense of the Union. He was also one of the fathers of the Pennsylvania building association legislation under which the city of Philadelphia has flourished and become known throughout the world as "the City of Homes."

He was in 1867 elected by Councils to be his city's representative on the Board of the Northern Liberties Gas Works Company, and has been re-elected unanimously ever since, at the expiration of a term of office. In 1870

he became active in the organization of the National Security Bank, Philadelphia, serving as vice-president from its establishment, and as president from 1885 to the time of his death.

In January, 1879, he was appointed a member of the Board of Education, and in 1889 was elected to its presidency, and to which office he was re-elected year after year until 1896, when he resigned from the board, his ill health making this step imperative. As president of the board he twice sent in his resignation from the office, feeling that he was no longer able to bear the burdens of the office, but the board each time refused to accept it, preferring to elect an acting president to attend to the duties of the office. The excellent school system of Philadelphia as it exists to day is due very largely to the wise counsel and foresight of Mr. Sheppard. While a member of the Board of Education he was a member for nine years of the Committee on Property, and for six years of the Committee on Night Schools. The remembrance of

his own want of educational opportunities in youth made him especially interested in the work of the Committee on Night Schools. He was also a member of the committee appointed to organize the School of Industrial Art and the Central Manual Training School.

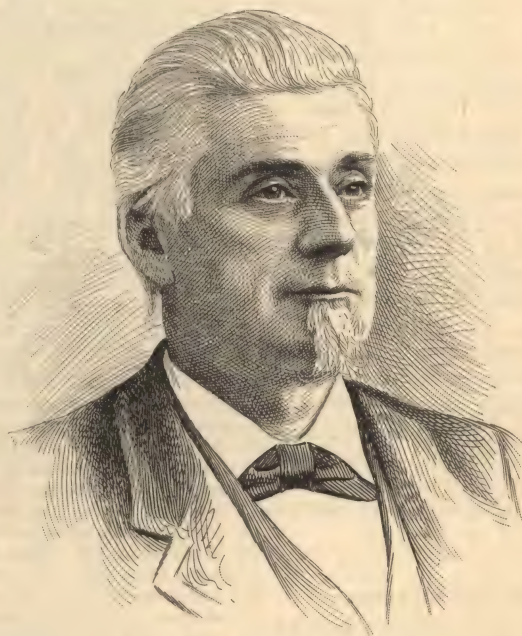
His health not improving, he dropped one by one all the offices held by him, with the exception of the presidency of the bank, his attendance at the bank continuing until late last fall.

He was a Master Free Mason, Past Grand Master of Odd Fellows and Ex Grand Treasurer of the Sovereign Grand Lodge of Odd Fellows. His interest in church work included 25 years' service as superintendent of the Sunday School of Zion Protestant Episcopal Church, at Eighth street and Columbia avenue. At the time of his death he was the rector's

warden. He was also a member of the Union League Club and other organizations. Mr. Sheppard was a man greatly respected in business circles. He was possessed of excellent judgment, and his great tact and foresight were used to advantage in the different interests in which he figured. He was an untiring worker and thought no labor too great which tended to advance any of the institutions he was connected with. His personal attraction was such that harmony was assured at any board on which he served. In all his dealings he was most fair and just, and his charity will be long remembered by those among whom it was dispensed. The city of Philadelphia has lost a noble citizen and the stove trade of the country, with one exception, its oldest manufacturer.

Mr. Sheppard was a widower, his wife having died recently. He leaves behind him his two sons, Franklin L. and Howard R. Sheppard, who have been in recent years active in the management of the business founded by their father.

The funeral was held on Wednesday, interment being made at Laurel Hill Cemetery.



ISAAC A. SHEPPARD.



### The One O'Klok Klub.

Our readers have probably waited with considerable impatience for some further account of the proceedings of the One O'Klok Klub of Chicago. This organization, which has become famous in the annals of the Chicago stove men, has not been disbanded, which might have been inferred from our long silence. On the contrary, it is enjoying more vigorous life than ever, and the daily reunions of the members are full of the true spirit of the times. The members are strongly imbued with the war fever and would go to the front with alacrity in case of hostilities with Spain, especially if a call for volunteers should be received immediately after dinner. At that time their courage is always at fighting heat. They have a choice collection of weapons in their armory, which were presented them for ornamental purposes, but could be used effectively for offense or defense. If the enemy could see some of the fearful curios in their museum they would flee from their presence in terror. At the last meeting of the Klub the redoubtable Grange Sard was observed looking askance at a new life mask of Frank Mixer of the Rock Island Stove Company, which announced his life membership in this select organization. But there are other things even more terrifying.

### A New Stove Foundry.

The Bonnet-Nance Stove Company of Quincy, Ill., who have for some time been seeking a location in the vicinity of Chicago, have concluded negotiations for a site at Chicago Heights. They will have about 10 acres of land. Their main building will be two stories high, 50 x 800 feet, constructed of steel frame work and brick and stone walls. It will be used for mounting and storing stoves. The foundry will be 86 x 450 feet, 25 feet high. Switch tracks will run through the grounds and buildings, enabling raw materials to be delivered and stoves shipped out with a minimum of handling. An elevated track will run to the cupola platform, to save the hoisting of raw materials. The power to operate the plant will be furnished by two boilers and a 300 horse-power Corliss engine. The equipment is to be of the most modern and improved character. An effort will be made to get the buildings ready for occupancy by May 1. The officers of the company are as follows: J. J. Bonnet, president; R. W. Nance, vice-president; L. A. Bonnet, secretary and treasurer. Their plant at Quincy was burned some months since, and they concluded not to rebuild at the same location, although they had been in business there since about 1862.

### Perfection Gas Stoves and Heaters.

The annual catalogue which has just been issued by the Milwaukee Gas Stove Company of Burrell and Chase streets, Milwaukee, Wis., is a very neatly printed and arranged pamphlet of 48 pages bound in colored paper covers. In their announcement to the trade the company state that on account of steadily increasing sales they have been compelled to secure larger manufacturing facilities, and now have a finely equipped plant for the manufacture of gas appliances, enabling them to turn out a very much larger number of goods than ever before. They have added several new ranges, grates, heaters and radiators to their line this season, all of which embody the latest improvements. Special reference is made to their instantaneous cleanable burner, so constructed that by the simple raising of a lever all accumulation of dirt from overboiling pots and kettles is forced to the surface, where it can be brushed off; telescopic oven burners which, it is claimed, enable the operator to light and regulate the oven flame without stooping down or opening the oven doors; adjustable needle valve, by means of which the air and gas pressure can be regulated independent of each other; star shape burners, which distribute the heat over the entire surface; large ovens, water heater, &c. The Perfection line of gas ranges is described and various styles illustrated together with Perfection portable stoves, Perfection gas water heaters, hot plates, laundry stoves, tinniers' soldering furnaces, coffee roasters, gas kilns for firing painted or decorated china, glass ware, &c., Dresden gas kiln, various styles of gas grates, gas radiators and gas heaters. A number of testimonials and a telegraphic code occupy the closing pages of this well printed publication.

### Gas Ranges on Trains.

The latest improvement on the Empire State Express, says the Albany *Argus*, is the introduction of gas ranges in the buffet cars, where steaks, chops, broilers, ham and eggs, &c., are cooked as quickly and deliciously as in any metropolitan hotel or restaurant. An idea of the popularity of this new feature of the Wagner service can be obtained from the fact that in the month of January 1243 orders for steaks, chops, broilers, &c., were filled on this one train alone, and to the satisfaction of the passengers. Here are the orders in detail:

Sirloin steaks.....	593
Tenderloin steaks.....	38
Mutton and English chops.....	389
Broilers.....	151
Quail.....	44
Ham and eggs.....	28
Total.....	1,243

### ODD PLATES.

The business formerly conducted under the title and style of M. L. Nyberg & Co., Limited, will hereafter be carried on under the name of the Odin Stove Mfg. Company, Limited, 1216-1218 Peach street, Erie, Pa. The stockholders of the company remain the same, with the exception of the former president, M. L. Nyberg, whose interests have been purchased by C. F. Hoffstetter, who will hereafter conduct the business of the concern as president and manager. The company state that Mr. Nyberg is no longer connected with them in any capacity whatever.

Isaac A. Sheppard & Co. of Philadelphia, Pa., continue favoring their friends in the trade with attractive cards calling attention to their specialties in the heating line. The last one to reach us bears at the left a picture of a burly policeman, whose left hand grasps his club, while the right is raised in a warning manner, as though signaling to "stop." The company evidently use this picture to emphasize the remarks presented on the card, for they say that the cards will be stopped if the senders are notified that they are not wanted any longer. They go still further and say that the cards will be stopped if the dealer feels that he does not want any more business than he now has, or that he does not think it will pay him to sell the Paragon Furnace and the Excelsior Range and that his customers would rather have a cheap Furnace than a good one. The alternative which the company offer is for the dealer to send an order for a sample Furnace and Range, or write them that he is going to try and push the company's goods. Either way, the manufacturers state, will stop the cards, otherwise they will continue coming until both manufacturers and dealers see the same way.

The Atlanta Stove Works of Atlanta, Ga., have commenced operations on their new factory, which when completed will give them more than double their present capacity. The site of the new works is near Edgewood avenue, on the line of the Southern Railroad. The present molding room, we understand, will accommodate 36 molders, while the new one will have facilities for 82. Other departments will be increased from 8 to 15 and from 65 to 150. The molding room will be a frame structure, 70 x 300 feet, covered with corrugated iron. The brick warehouse will be 70 x 160 feet in size and three stories in height, while the foundry proper will be 40 x 170 feet. We understand that the company have placed their order for a 75 horse-power engine and a 100 horse-power boiler.

The employees of the Dangler Stove & Mfg. Company of Cleveland, Ohio, held their seventh annual prize masquerade ball at Germania Hall on Saturday, February 26. We understand that eight Gas, Oil and Gasoline Stoves were given away as prizes.

The Wakefield Foundry of the Smith & Anthony Company of Boston, Mass., which was shut down for a time, resumed operations on March 1.

At the annual meeting of the Art Stove Company, held in Detroit, Mich., on the afternoon of February 23, the following directors were elected: Neil McMillan, W. H. Fernwood, Charles Campbell, Richard Renther and John O. Campbell. The Board of Directors elected Neil McMillan president, John O. Campbell vice-president and treasurer and Charles Campbell secretary.

Two large schools at Ogdensburg, N. Y., have been successfully heated during the past winter by six No. 62 Kernan All Cast Iron Furnaces made by the Kernan Furnace Company, Utica, N. Y.

The Rutland Fire Clay Company of Rutland, Vt., are distributing some neat folders calling attention to their specialties, including the Rutland Stove Lining, which is claimed to fit any stove and can be put on in a few minutes. The fire can then be started at once. The company suggest that on the outside of the stove Big-box Stove Polish be used, the claim being made that it blacks easier,



blackener and stays black longer than any other Stove Polish they know anything about. The company state that when the dealer has a Vermont Polishing Mitten and some Big-box Stove Polish, blacking the stove becomes an easy, pleasant task, comparatively speaking.

The Vogelgesang Furnace Company of Columbus, Ohio, were incorporated a few days ago, with a capital stock of \$25,000. The incorporators include Frank S. Bartlett, D. A. Ebinger, Frank P. Hall, Edward W. Vogelgesang and George B. Durrant.

The Millett Core Oven Company of Brightwood, Mass., favor us with a four-page circular illustrating Millett's Patent Core Oven for use in foundries. This Oven, it is stated, has been in use for a number of years in some of the most completely equipped foundries in this country and Europe, and has given entire satisfaction, especially where quick and thorough baking of small cores was desired. The Oven is constructed of independent shelves, each having two doors, one in front and one at the back, which close the Oven when the shelf is swung out to put in or take out cores, thus effecting a great saving of fuel and heat. As usually made the Oven has six doors, each 5 inches high, and one door 10 inches high, although the manufacturers state that they can furnish Ovens with doors of any height up to 15 inches. The front and shelves are furnished already put together and in condition to set in the brick, but they do not furnish the fire box, as every foundryman has his own way of heating. The circular shows the Oven both in portable form and for brick setting, and at the same time gives a list of some of the concerns who are using the Millett Core Oven. Among the many foundry concerns we notice some Stove manufacturers, such as the Walker & Pratt Company, Boston, Mass.; Weir Stove Company, Taunton, Mass., and the Magee Furnace Company, Chelsea, Mass.

One of the best dentist stories we have heard for some time comes from a prominent Chicago Stove man. He says that he recently went to the office of a very popular Chicago dentist and took his seat in the reception room to await his opportunity to receive some pleasing attention from the dentist. While sitting there he heard the sound of snoring coming from the dentist's operating room. He could hear the whirring of the drill and afterward the operations of the dentist's hammer mingled with the undoubted snores coming from some sturdy subject. After some time the snoring ceased and a gentleman walked through the reception room whose features were wondrously familiar to our friend. He racked his brain to try to recall who the man could be, but, his memory affording him no solution, he did not claim the attention of the gentleman, and being called to take his place in the operating room he walked in. Saluting the dentist he inquired who the individual was that had just passed through. He was informed that it was Theodore Thomas, the well-known musical director. Our friend inquired who had been snoring just a few minutes previously, and the dentist replied that it was Mr. Thomas, and the fact was then disclosed that so deftly had the dentist been performing his work that Mr. Thomas had actually been able to take a very comfortable sleep in the dentist's chair during this very engaging occupation of having his teeth filled. Could it be possible to conceive of anything more flattering to a dentist's skill than the fact that his subject could take a comfortable sleep and positively snore while undergoing such an ordinarily unpleasant experience?

The Kernan Furnace Company, Utica, N. Y., have secured the contract for and have successfully heated the Calvary Church Chapel, Utica, N. Y., with two of their No. 100 Series Furnaces and the M. E. Church of Paris Hollow with one of their Union Furnaces.

The death is reported last week in Pittsburgh, Pa., of James Graham of the Stove foundry firm of Crea, Graham & Co. Mr. Graham was in the sixty-eighth year of his age, and was formerly a member of the firm of Graham & Co., proprietors of a salt works.

The Yeager Hunter Spring City Stove Works, Spring City, Pa., are introducing a new Range under the name Majestic New Era. It is supplied in three sizes, ovens 16 x 16, 18 x 18 and 20 x 20 inches, either right or left hand. It has a cut top, with reducing covers, and is of sheet flue construction with gas burner attachment. The top and shelf are flush with the top, back and front. It has a cabinet base with 14-inch feet. The grate is removable without disturbing the water back or brick rests. There is an anti-clinker poke hole in the end. The dampers work entirely from the top of the Range, and there is a check draft slide on the top. The oven is fitted inside with roasting hooks. The Range is supplied either with or without a reservoir, and the reservoir is furnished with a spigot. End or front ash pits are furnished, as may be required. The design of the Range is very handsome and the oven door is of oval shape.

The Michigan Stove Company make an important announcement to the trade. After a series of experiments they have at last succeeded in perfecting a process of ap-

plying aluminum to oven doors and oven racks. This finish they have applied not only to all of the celebrated Garland line, but to all except the very lowest priced Stoves and Ranges in their assortment. They state that Stoves and Ranges thus treated should be eagerly sought after by neat and tidy housekeepers, as by this process of treatment the brightest and cleanest ovens are obtained. The result of this treatment is that, however thickly the inside of the oven door or oven rack may become incrustated with grease or other products of baking or roasting, all will soon burn off and leave the oven door and oven rack as bright as they were before being used. In other words, it is self cleaning. The grease can also be washed off with soap and water. Consequently a perfectly bright, clean and sweet oven is at all times assured. The company have applied for letters patent on this process of treating the inside of ovens with aluminum. Their agencies are therefore again placed in possession of an exclusive and unique selling feature, the utility of which will no doubt add largely to the sales and popularity of Garland Stoves and Ranges. The Michigan Stove Company are as conspicuous as ever in introducing new and taking features.

### SCRAP.

The Ellwood Tin Plate Company, Ellwood City, Pa., are enlarging their capacity considerably.

The Aetna-Standard Iron & Steel Company, Bridgeport, Ohio, are making some very important improvements and additions to their Bessemer Steel plant at Mingo Junction, Ohio. Larger converters are being installed, new rolling mill equipment added, and the plant will be made a thoroughly modern Bessemer Steel plant in all particulars. New blowing engines are also being added to the blast furnace equipment so as to permit the operation of both furnaces at the same time, which heretofore has been impossible owing to inadequate blowing capacity. It is the intention of the firm to run both furnaces to supply metal for the Bessemer plant. This concern are also making improvements in their Sheet mill, Tin Plate and Galvanizing departments, at Bridgeport, Ohio.

Miller Brothers & Co., engineers and contractors, Tradesman's Building, Pittsburgh, Pa., have received a contract from the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., for the erection of eight Sheet and Pair furnaces for the addition to be built to the Tin Plate plant of that concern. They have received a contract for a four-door Heating Furnace for the Ajax Forge Company of Chicago, and also an order for the additional work at the Joliet works of the Illinois Steel Company.

About 30 employees of the National Tin Plate Company, Monessen, Pa., have gone out on strike, and as yet the trouble has not been adjusted. It is expected, however, that a settlement of the difficulty will be reached in a few days, as the differences between the men and the firm are said to be very slight.

The plant of the Pittsburgh Tin Plate Works, at New Kensington, Pa., has been compelled to close down temporarily owing to a break in the water works service.

The Lalance & Grosjean Mfg. Company, New York City, are contemplating the addition of two new hot mills to their Tin Plate plant at Harrisburg, Pa. The plant is running full in all departments at the present time, a fourth tin mill having been recently put in operation. About 300 hands are steadily employed. Nevertheless the existing requirements of the company's factory at Woodhaven, L. I., are so large that the entire output of the Harrisburg mills is not enough to fill them.

The Welsh & Kerry Mfg. Company of Reed City, Mich., have opened a branch factory at Saginaw, Mich., for the manufacture of Tin Plate boxes and other wood specialties. The company have enough orders for Tin Plate boxes on their books to keep this department busy in both their Saginaw and Reed City works for an indefinite time.

W. C. Brown, 36 La Salle street, Chicago, manufacturers' agent for the sale of Bar and Sheet Iron, Tin Plate, &c., is distributing favors among his friends in the trade in the form of excellent lead pencils bearing his name and address.

Although it has been readily understood by the tin plate trade in this country that since its virtual establishment, at the time of the enactment of the McKinley tariff laws of 1890, the industry of South Wales has been suffering materially, the failure of two of the largest mills on the other side came rather in the form of a great surprise. Morewood & Co., the largest manufacturers of tin plate in Wales, have announced the fact that they are unable to meet their payments. This concern possess realizable assets of great value and are a firm of high reputation. The entire force of workmen has agreed to an immediate reduction of 15 per cent. in wages. Directly after the Morewood failure the Morriston & Midland tin plate works closed down, throwing 600 men out of employment.



# TRADE REPORT.

## METAL MARKET.

**Pig Tin.**—Only a fair amount of business has been transacted during the last week, but the market has maintained its firmness and prices for large lots have had an upward tendency. Transactions in the London market, however, were large, and the business was probably better than at any time during the year. There has been a total absence of speculative movement, which is indicative of the fact that last week's business was transactive solely for consumptive purposes. Up to this writing arrivals have been small. They amount to 285 tons. There is considerable afloat, however, and as far as can be ascertained at present about 1000 tons can be expected within a week. The demand for Tin in mild quantities has not shown any change, and prices though stiff are not quotably different from a week ago.

**Copper.**—The market is holding its same strong position and is decidedly in the sellers' favor. It is absolutely devoid of any speculative movement, and all of the metal that is purchased is purchased on account of an absolute necessity to supply consumptive demands. The market is dull, but exceedingly firm. Companies claim a fairly good demand for home consumption, while export demand does not seem to be up to the asking price. Exports so far this month have been small, and amount to 1694 tons for the week closing March 7, as per Metal Exchange returns. The unusual activity of the electrical works in this country occasions what demand there now is at the present high figure. The price for Copper in small lots is unchanged. Sheet Copper is in good demand at unchanged figures.

**Pig Lead.**—There has been an easy market during the latter part of the week under review and the buyers have all in their favor. Our Chicago correspondent reports heavy sales and steady prices, while from St. Louis we hear of a fair demand at firm prices. In this market there is no change to report in small lots, and manufactured Lead remains at former quotations.

**Spelter.**—Is firm and has an upward tendency. Prices have advanced over last week's quotation and there is a great consumptive demand. In small lots there is no change to record.

**Antimony.**—The market is firm, with an advance of 10 points in Hallett's, and we now quote Hallett's at 7 $\frac{3}{4}$ c. and Cookson's at 8c. to 8 $\frac{1}{2}$ c.

**Nickel.**—Is still holding at 33c. to 37c., according to quantity and delivery, and remains inactive and unchanged.

**Tin Plate.**—There is comparatively little doing just now, as the dealers are entirely nonplussed regarding the movements of the committee which is promoting the proposed consolidation scheme. Many rumors have been afloat regarding the subject, but none have as yet stood verification. The rumor that P. Armour proposed interesting himself in the scheme to the extent of the much needed \$3,000,000 was emphatically denied by him last week. In our endeavor to confirm the rumor that the Western makers were bringing the "combine" to a close independently of the "Big Four" in New York, and that another Chicago capitalist had decided to do what Mr. Armour refused to do, our correspondent telegraphed us: "He is not working on consolidation scheme; nobody at work here as far as can be learned; local makers say they have no faith in the scheme." Nevertheless, rumors persist in certain quarters that a scheme of regulation of some sort is not dead, and even that the plan for selling out the works as broached in New York a month or two ago still has a spark of life in it. There is a strong feeling with some that action should be taken toward harmonizing the work of the mills, if to no other end than that the crossing of orders and the consequent waste of money for freight charges might be saved. By districting the country, it is pointed out, there would be the saving of long distance freight charges, each region being supplied from nearby mills. Plans of this sort have been carried out in other departments of the Iron and Steel trade, but it remains to be seen how far the Tin Plate trade can follow any plan of co-operation. There is only a fair demand for Tin Plate in small lots at unchanged prices. Stocks of Coke Plates in this market are somewhat broken, but prices do not stiffen.

## THE IRON MARKET.

Between the conflicting statements relative to the consolidation of the Wire interests the truth lies midway. Far from having been accomplished, as announced, the negotiations have taken an adverse turn. The Pittsburgh Wire Company have withdrawn altogether, but a final rupture has not yet taken place between the bankers and one very important concern, whose own estimate of the value of their property and business, as represented by the option given, differs widely from that placed upon it by the accountants, on the basis of which the bankers have made an offer. Whether these differences cannot be reconciled may develop at an early date. It would be going too far to say, however, that the whole plan has fallen through. If it does interesting developments may be expected in the Steel market, out of which the Wire interests have kept, so far as covering for future delivery is concerned. From Pittsburgh comes the report that that movement has already begun in a moderate way. Whether the Wire trade generally would be adversely influenced is discussed with some interest, although it hardly seems reasonable that personal differences should tell.

A little better feeling is developing in the Cast Iron Pipe trade, which is so influential a factor in shaping the destinies of Foundry Iron. Our monthly statistics show an increase in current make on March 1 over February 1 of about 5300 tons weekly. A partial stock report indicates an increase of 22,600 tons during February, which proves that while the demand is very heavy it is not yet capable of absorbing our whole product.

**Pig Iron.**—The market in New York continues in an unsettled condition, without any improvement in prices. We quote as follows: Northern brands, No. 1, \$11 to \$11.50; No. 2, \$10.50 to \$11; No. 2 Plain, \$10 to \$10.50. Southern brands, same delivery: No. 1, \$10.75 to \$11.25; No. 2, \$10.25 to \$10.50; No. 1 Soft, \$10.75 to \$11.25; No. 2, \$10.50 to \$11.

In Philadelphia the Pig Iron market has been dull and uninteresting all through the week. Sellers have been able to move a fair amount of material, but the best that could be done was to maintain last week's prices. There is a continued pressure to secure business, and the outlook for the immediate future is not encouraging. It will not take many days, however, to settle the question as to which way the market will move, but the market has got to move out of the rut before there can be anything like general activity. Prices for seaboard deliveries are about as follows, with the usual rebate according to freights at points within a radius of 100 miles south or west: No. 1 X Foundry, \$11.75 to \$12; No. 2 X Foundry, \$10.75 to \$11; No. 2 Plain, \$10.40 to \$10.50.

The demand for Pig Iron in Chicago shows no abatement and good business is continually coming up. Large inquiries are in the market for Foundry Iron, one of them calling for 3000 to 4000 tons. Good sales of local Coke Iron have been made. One house reports having had the largest week's tonnage for this year, notwithstanding higher prices are asked than for Southern. These transactions were not confined to a few large consumers, but buyers were quite numerous. The situation of the local manufacturers is now very strong, and they are inclined to advance quotations still further. The sales of Southern Coke may not have been quite so large as during the previous week, but they amounted to a very respectable tonnage. We quote for cash as follows:

Lake Superior Charcoal.....	\$12.00 to \$13.00
Local Coke Foundry, No. 1.....	11.50 to 12.50
Local Coke Foundry, No. 2.....	11.00 to 12.00
Local Coke Foundry, No. 3.....	10.50 to 11.50
Local Scotch, No. 1.....	11.50 to 13.00
Ohio Strong Softeners, No. 1.....	12.00 to 12.25
Southern Silvery.....	11.25 to 11.50
Southern Coke, No. 1.....	11.00 to 11.25
Southern Coke, No. 2.....	10.35 to 10.70
Southern Coke, No. 3.....	10.10 to 10.40
Southern, No. 1 Soft.....	10.85 to 11.00
Southern, No. 2 Soft.....	10.35 to 10.70

The market for Pig Iron in the Pittsburgh district has been quiet the past week, and aside from several sales of Bessemer Pig for March and April delivery very little has been done. The furnaces there are very firm in their views as to prices for second and third quarter. Foundry Irons continue very dull. We quote f.o.b. Pittsburgh, the rate from Valley being 65c.: No. 1 Foundry, \$10.40 to



\$10.50 ; No. 2 Foundry, \$9.85 to \$10; Bessemer, \$10.30 to \$10.40.

Cincinnati advices report that the market in Pig Iron for the past week has been rather unsatisfactory to all agents representing those Southern furnaces which are interested in the recent combination to maintain prices. About all the business that has been done on the \$7.25 basis for No. 2 Foundry has been small orders running from carloads to 50 tons. There has been a good deal of Iron sold, however, by those furnaces not in the pool, and also by parties holding warrants. The outside furnaces are getting \$7 for No. 2 Foundry. The warrant Iron is being sold on even a lower basis than this. But little business is expected during the coming week, but the probability is that after these outside companies have filled themselves, which will probably be in a week or so, business will resume its normal current. The deliveries are going on about as usual, and fair minded parties are quoted as regarding the market satisfactory and normal in the main. In Northern Irons the situation has been unchanged, and probably it may be truly said that the general situation, both as to North and South, is steadier than it has been. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$9.75 to \$10.00
Southern Coke, No. 2.....	9.25 to 9.50
Southern Coke, No. 3.....	9.60 to 9.25
Southern Coke, No. 1 Soft.....	9.50 to 9.75
Southern Coke, No. 2 Soft.....	9.25 to 9.50
Southern Coke, Gray Forge.....	8.50 to 8.75
Southern Coke, Mottled.....	8.50 to 8.75
Ohio Silvery, No. 1.....	12.00 to 12.50
Ohio Silvery, No. 2.....	11.50 to 12.00
Lake Superior Coke, No. 1.....	11.00 to 11.50
Lake Superior Coke, No. 2.....	10.50 to 11.00

The market in St. Louis continues without material change. There continues to be more or less weakness in prices and furnaces are apparently quite anxious for business; at least some of the prices which have been made would seem to indicate that their order books are quite bare. Sales during the week were not heavy, being confined largely to carload lots with an occasional sale of 100 to 200 ton lots. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry.....	\$10.00 to \$10.50
Southern, No. 2 Foundry.....	9.75 to 10.00
Southern, No. 3 Foundry.....	9.50 to 9.75
No. 1 Soft.....	9.75 to 10.00
No. 2 Soft.....	9.50 to 9.75

CHICAGO REPORT.

Scrap.—Cheap grades of Iron are in strong demand, but best grades are quiet. Metals are active. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap.....	\$7.00	....
Machinery Cast.....	7.50	....
Malleable Cast.....	6.50	....
Stove Plate (free of burnt).....	5.50	....
Burnt Iron and Grate Bars.....	3.75	....
Sheet Iron and Hoops.....	3.00	....
Plow Steel and Breaking Stock.....	5.00	....
No. 2, such as Shovels, Hoes, &c.....	2.50	....
Old Boilers—whole (Iron).....	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings.....	6.50	....
Old Gas Pipe and Boiler Tubes.....	6.00	....
Cast Borings.....	3.50	....
Turnings.....	5.00	....
Horseshoes.....	9.00	....
Copper Wire and Heavy.....	10 1/2 c.	....
Copper Bottoms.....	9 1/2 c.	....
Copper Clips.....	10 c.	....
Red Brass.....	8 1/2 c.	....
Yellow Brass.....	7 1/2 c.	....
Light Brass.....	5 1/2 c.	....
Pipe Lead.....	3 c.	....
Tea Lead.....	3 c.	....
Zinc.....	3 1/2 c.	....
Rubber.....	4 c.	....
Inside Bicycle Tubing.....	10 c.	....
Outside Tubing.....	3 1/2 c.	....
Rubber Hose.....	1 c.	....

Anthracite.—Shippers have advanced the schedule 25 cents. Although the demand is light, the advance is well maintained. The prices of carload lots of 12 tons minimum are as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill.....	\$5.00	\$5.25
Milwaukee, Wis.....	5.00	5.25
Kansas City, Mo.....	7.00	7.25
Council Bluffs, Iowa.....	7.00	7.25
Lincoln, Neb.....	7.15	7.40
Sioux City, Iowa.....	7.50	7.75
Aberdeen, S. Dak.....	8.25	8.50
Dubuque, Iowa.....	6.30	6.55
Madison, Wis.....	6.50	6.75
St. Paul, Minn.....	7.50	7.75
Burlington, Iowa.....	6.50	6.75
Des Moines, Iowa.....	7.00	7.25
Davenport, Iowa.....	6.30	6.55
St. Joseph, Mo.....	7.00	7.25
Leavenworth, Kan.....	7.00	7.25
Omaha, Neb.....	7.00	7.25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.	
Denver.....	\$6.50
Pueblo.....	6.50
Colorado Springs.....	6.50
Leadville.....	6.50
Cheyenne, Wyo.....	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

There continues to be an excellent volume of business in the West, reports indicating very satisfactory activity and a more liberal movement of goods than for several years at this season. In the East there is not the same improvement noticeable, but the market is feeling the effect of the increased demand from the interior and, on the whole, the indications are favorable for good business. The talk of war has doubtless had some effect in restraining enterprise and keeping back business. The failure thus far of the plans to consummate the consolidation of the Wire Rod interests has the effect of giving a slightly weaker tone to the products directly affected. In general, prices in Shelf and Heavy Hardware are unchanged and apparently awaiting a marked increase in the demand before taking a turn upward. Collections generally are satisfactory.

Advices from Chicago.—Spring trade in Shelf Hardware now seems to be in full tide of activity. The local jobbing houses found their orders on Monday of this week far in excess of anything known for many months. The demand for some kinds of goods is reported phenomenal. A very heavy business has been done in all kinds of Steel Goods and all sorts of Garden Tools. Some lines of House Furnishing Goods have also been called for so heavily as to test the capacity of the manufacturers. The movement of seasonable goods is beyond expectations. Bad roads are interfering with business in some sections of the West, but good drying weather has prevailed over other localities and consequently the general volume of business does not seriously feel the effect of this unfavorable influence. Heavy Hardware jobbers are also in receipt of a good trade, which covers all kinds of Wagon and Carriage Stock as well as Iron and Steel.

Advices from St. Louis.—The Hardware jobbing trade report a most excellent demand for all lines of goods and the present month promises to show a heavy increase over the corresponding month of last year. In Builders' Hardware a heavy business is reported and the amount of building throughout this section is enormous. Shelf Goods, Edge Tools, Files, &c., are selling very freely, particularly Files, which are being ordered in larger volume than for months past. Screws, Carriage and Machine Bolts, Corrugated Iron and Terne Plates are all good sellers just now. Prices are being well maintained, and in Barb and Plain Wire and Wire Nails advances have been made which are being firmly adhered to. The general conditions are excellent. Collections are excellent.

NOTES ON PRICES.

Wire Nails.—There has been no important change in the Wire Nail market and during the past week the volume of business was moderate, owing to the liberality with which orders were placed last month, prior to the advance which went into effect March 1, and also to the feeling of uncertainty that prevails in regard to the consummation of the plans for the consolidation of the Wire interests, the outcome of which is at least problematical. Notwithstanding the delay in the consummation of the plans and the serious difficulty which it is understood is being encountered, the market for Wire Nails continues fairly steady. New York quotations are on the basis of \$1.70 to \$1.75 for small lots from store.

Advices from Chicago.—The situation is rather uncertain and probably will be so until something definite is known concerning the proposed consolidation. Jobbers have enjoyed a good demand for small lots, but have not advanced their prices to correspond with the full rates named by manufacturers. Small lots from stock are quoted at \$1.65, but all sellers have not adhered closely to this price. The Mississippi River jobbers are understood to have advanced their rates to \$1.80 for small lots.

Advices from St. Louis.—The market is in a firm position. Jobbers report a heavy demand and quote \$1.65 to \$1.70, base, for small lots from store.

Cut Nails.—The Cut Nail market remains steady. Some efforts are being made by the manufacturers to work together so as to obtain a slightly higher figure in sympathy with the condition of the Wire Nail market. The price in New York is \$1.25 to \$1.30 for small lots from store.



**Advices from Chicago.**—The demand is very limited and the light trade moving is being done at the old price of \$1.45 for small lots from stock.

**Advices from St. Louis.**—There is some improvement in the demand for Cut Nails, but prices are inclined to weakness. Jobbers ask \$1.40 to \$1.45, base, for small lots from store.

**Barb Wire.**—The Barb Wire market presents few new features. The trade are not disposed to buy freely at present, awaiting some definite outcome of the Wire Rod negotiations.

**Advices from Chicago.**—Manufacturers report absolutely no stock on hand and shipments from factory continuing very heavy on old contracts. The future of this branch of trade will, of course, depend on the result of the deliberations over the consolidation. Jobbers continue to quote small lots from stock at the same price as that asked by manufacturers for carload lots, and report a very good demand from the retail trade.

**Advices from St. Louis.**—The demand for Barb Wire is exceptionally heavy. Mills report a larger volume of business than for months past. Jobbers report a steady increase in the demand, and quote small lots at \$1.70 for Painted and \$2 for Galvanized.

**The Peck, Stow & Wilcox Company.**—Under date March 1 the Peck, Stow & Wilcox Company, Southington, Conn., and New York, have issued a discount sheet applying to their 1898 catalogue, reference to which is made in another column.

**Glass.**—Local demand for Window Glass continues limited. Jobbers at some of the Atlantic Coast points recently agreed to hold Window Glass in less than carload lots at 85 and 10 per cent. discount, a price which has been obtainable for some time past. This agreement, however, has not materially strengthened the market, as 85 and 15 per cent. discount is now given in some cases. Various rebates are to be allowed by the American Glass Company for different quantities of Glass purchased by April 1. This was supposed to indicate that advanced prices would go into effect at that time, but no announcement of higher prices has been made. Demand from factory is reported as being strong; also that a number of jobbers are still holding off for lower prices.

**White Lead.**—The distribution has been in a jobbing way, covering immediate and nearby requirements. Prices and terms remain unchanged, with no indications of any upward or downward movement.

**Red Lead.**—Nothing outside of ordinary business is being done, but this is fair in amount, with prices steady for both domestic and foreign products.

**Linseed Oil.**—There is a very commonplace demand, jobbers being conservative in their purchases. Under ordinary circumstances present price of raw material would result in higher values, but outside competition is depressing the market to some extent.

### Color Photography.

At a recent meeting of the Royal Photographic Society in London, Prof. Gabriel Lippman described his system of color photography, whereby a photograph showing the colors of nature is obtained by a direct process and with only one exposure of the plate. The film, which might be of any sensitive substance, he explained, was exposed, developed and fixed in the usual way. Two conditions, however, must be observed. The film must, in the first place, be transparent and grainless, and in the second it must be in contact with a metallic mirror during exposure. The effect of the mirror, which was formed by running a layer of mercury in behind the plate, was to reflect back the incident colored rays and thus make the incident light waves stationary. These stationary vibrations, falling in the interior of the sensitive film, impressed their own structure upon it, and by virtue of the structure thus imparted to it the brown deposit of silver, when viewed by reflected white light, appeared clothed with the same colors as were possessed by the image in the camera. The colors were produced by "interference" in the same way as those of the soap bubble or mother of pearl. That this was their cause M. Lippman said was proved by the fact that the tints of a negative changed if it were damped in consequence of the gelatine swelling slightly and thus altering the structure of the silver deposit. The colors produced by this process were true and bright, provided that exposure and development had been properly conducted. They were, moreover, completely fixed, and resisted the action of light and time. He had not yet succeeded in taking prints from his negatives, but was convinced that to do so would be found possible.

**Luxfer Prisms as Fire Shields.**—The use of Luxfer prisms for fire shields was tested publicly last week in

Chicago. The prisms stood the effects of a hot fire and streams of cold water without breaking, and those who saw the experiment came to the conclusion they would be highly serviceable as fire screens in large warehouses and factories. Experiments along this line have been privately made for a number of weeks by the Luxfer people. About a dozen insurance men and manufacturers and Chief Swenie of the Fire Department witnessed the public exhibition. When the fire was hottest streams of water were turned on the glass, and while the prisms cracked none of them broke, and not even a splinter of glass fell from the frame work. This is thought to prove conclusively the serviceableness of the material for fire windows. It has the great advantage over fire shutters that the firemen can see through it and that in case of necessity it is easily and quickly broken.

In their advertisement elsewhere in this issue Follansbee Brothers Company, 328, 330 and 332 Second avenue, Pittsburgh, Pa., direct attention of the trade to Tinner's Tools and Machines. They state that they can furnish anything desired in this line, and at attractive prices. The inquiries of the trade are solicited.

### CONTENTS.

	PAGE.
<b>Editorials—</b>	
The Business Situation.....	31
Plumbing Schools Here and Abroad.....	31
The Navy of Spain.....	
<b>The Letter Box—</b>	
Galvanizing Wringer Castings.....	33
Water to Boiler Surface.....	33
Repairing Agate Ware.....	33
What Makes the Radiator Noisy?.....	33
Laundry Drier. Illustrated.....	34
Lead Lined Tanks.....	34
<b>The Retail Store—</b>	
Rockford Grates. Illustrated.....	35
The Glacier Refrigerators. Illustrated.....	36
Memoranda.....	36
<b>Heating and Plumbing—</b>	
Heating and Ventilating a Bayonne School. Illustrated.....	37
Gas Tied Up in Red Tape.....	39
The Palace Regent Solid Safety Boilers. Illustrated.....	40
Plumbing Classes in England and in the United States.....	41
Bundy Exhaust Head. Illustrated.....	43
Chicago Master Plumbers' Protective Association.....	43
Baltimore Master Plumbers' Mutual Protective Association..	43
National Delegates.....	44
New York State Plumbers.....	44
Minnesota Examining Board.....	44
A Convenient Lavatory Attachment. Illustrated.....	44
Notes.....	44
<b>Sheet Metal Work—</b>	
There Is No New Thing Under the Sun. Illustrated.....	46
Sheet Manufacturers' Association.....	47
Baker's Eave Trough Hanger. Illustrated.....	47
Peck, Stow & Wilcox Company's Catalogue.....	47
Flashings.....	47
The Philadelphia Exposition.....	47
Fluctuations in the Prices of Sheets. Diagram.....	48
<b>Stove Trade Notes—</b>	
Isaac A. Sheppard. Portrait.....	49
The One O'Klok Klub.....	50
A New Stove Foundry.....	50
Perfection Gas Stoves and Heaters.....	50
Gas Ranges on Trains.....	50
Odd Plates.....	50
Scrap.....	51
<b>Trade Report—</b>	
Metal Market.....	52
The Iron Market.....	52
Chicago Report.....	53
The Hardware Trade.....	53
Notes on Prices.....	53
<b>Color Photography</b> .....	54
Luxfer Prisms as Fire Shields.....	54
Metal and Miscellaneous Prices.....	55
<b>Labor Exchange—</b>	
Help and Situations Wanted.....	60



Metal and Miscellaneous Prices.

CHICAGO, MARCH 10, 1898.

Tin—  
Straits pigs.....15½@16½

American Tin Plates—  
American Base Box Quo-  
tations.

Based on 32,000 square inches in a box,  
which is exactly 2 per cent. more than in  
the English base box of 14 x 20 Tin  
Plates. The American base box weighs  
110 lb and the English base box 108 lb.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14, 110-lb.	"	240 sheets.	\$5.65
"	140-lb.	"	7.25
12 x 12, 110-lb.	"	"	5.75
"	140-lb.	"	7.50
14 x 20, 110-lb.	"	120	5.65
"	140-lb.	"	7.25
"	160-lb.	"	8.85
"	180-lb.	"	10.45
"	200-lb.	"	13.15
20 x 28 double the price of 14 x 20.			
12½x17, 140-lb.	"	120 sheets.	5.85
"	180-lb.	"	6.95

Second Grade Charcoal—Bright.

10 x 14, 110-lb.	240 sheets.	5.10
"	140-lb.	6.15
12 x 12, 110-lb.	"	5.25
"	140-lb.	6.30
14 x 20, 110-lb.	120	5.10
"	140-lb.	6.15
"	160-lb.	7.25
20 x 28 double the price of 14 x 20.		

Highest Grade Coke—Bright.

10 x 20, 110-lb.	240 sheets.	5.75
12 x 12, 110-lb.	"	4.15
"	140-lb.	4.95
14 x 20, 110-lb.	120	4.00
"	140-lb.	4.85
20 x 28 double the price of 14 x 20.		
20x26½, 110-lb.	120 sheets.	8.00
20x20½, 110-lb.	"	8.85
20x32½, 110-lb.	"	9.90
"	140-lb.	12.35
20x39½, 140-lb.	"	15.00

Old English Method Quo-  
tations.  
Charcoal Plates—Bright.  
The price of 20 x 28 sizes is double the  
price of 14 x 20.

Per box.

IC, 10 x 14		
IC, 12 x 12		\$5.25
IC, 14 x 20		
IX, 10 x 14		
IX, 12 x 12		6.75
IX, 14 x 20		
IXX, 14 x 20		8.25
IXXX, 14 x 20		9.75
IXXXX, 14 x 20		11.25
DC, 12½ x 17		5.00
DX, 12½ x 17		6.50

Per box.

IC, 10 x 14		
IC, 12 x 12		4.75
IC, 14 x 20		
IX, 10 x 14		
IX, 12 x 12		5.75
IX, 14 x 20		
IXX, 14 x 20		6.75
IXXX, 14 x 20		7.75
IXXXX, 14 x 20		8.75

Coke Plates—Bright.

Per box.

IC, 10 x 14		
IC, 12 x 12		\$3.75
IC, 14 x 20		
IX, 10 x 14		
IX, 12 x 12		4.75
IX, 14 x 20		
IXX, 14 x 20		6.75
IXXX, 14 x 20		7.75
IXXXX, 14 x 20		8.75

Per box.

IC, 10 x 14		
IC, 12 x 12		\$3.75
IC, 14 x 20		
IX, 10 x 14		
IX, 12 x 12		4.50
IX, 14 x 20		
IXX, 14 x 20		4.50
IXXX, 14 x 20		4.50
IXXXX, 14 x 20		4.50

The reduction per box on lighter plates  
than IC 14 x 20 is as follows:  
100 lb.....15¢  
95 lb.....20¢  
90 lb.....25¢  
85 lb.....30¢

Terne Plates.  
The following prices are for IC 20 x  
28, the rate for 14 x 20 being half as  
much. IX is usually held at \$2.50 per  
box advance.

Per box.

Standard Old Style, 36 to 40 lbs. coating...	\$13.00@	\$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating...	10.50@	12.00
Worcester Grade, 12 to 14 lbs. coating...	8.00@	9.00
STP		
L Grade, 10 to 12 lbs. coating...	7.50@	8.00
Dean Grade, 8 to 10 lbs. coating...	7.25@	8.00

Imported Tin Plates—  
Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28.....	\$7.25	
IX, 14 x 28.....	\$10.00	10.25
IXX, 14 x 28.....	11.50	12.75
IX, 14 x 31.....	11.50	12.75
IXX, 14 x 31.....	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56.....	21.00	\$12.50
IXX, 14 x 56.....	24.00	14.00
IX, 14 x 60.....	23.00	13.50
IXX, 14 x 60.....	27.00	15.00

Iron and Steel Sheets—  
Black.

	Soft Steel.	Refined Iron.
Nos. 10 to 16... ½ lb	2.00¢	2.20¢
17 to 20... ¾ lb	2.10¢	2.30¢
21 to 24... 1 lb	2.20¢	2.40¢
25 and 26... 1 ¼ lb	2.30¢	2.50¢
27..... 1 ½ lb	2.40¢	2.60¢
Russia, Planished, &c. 100 lb.		
Patent Planished, ½ lb, A.....	\$10.20 @ 5¢	
Patent Planished, ¾ lb, B.....	9.20 @ 5¢	
Craig's Polished Sheet Steel.....	8½¢	
U.S. Polished Sheet Steel No. 27 A 5.05¢		

Galvanized.  
First quality.....dis. 80@80&2¼¢

Copper—Ingot.  
Lake.....12¾@13¢  
Casting Brands.....12¾@12½¢

Sheet and Bolt.  
New list, net.

Copper Bottoms.  
New list, net.

Seamless Brass and Copper Tubes.  
Base price, 17½¢, Chicago, with extras  
according to size.

Copper, Bronze and Gilding Tube, 3¢  
½ lb additional.

Brazed Brass Tubing, (100 lb lots).  
(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....	\$0.35
Plain, ¾ inch up to ¾ inch.....	.38
Plain, ¾ inch up to ¾ inch.....	.38
Plain, ¾ inch up to ¾ inch.....	.41
Plain, 5-16 inch up to ¾ inch.....	.08
Plain, ¾ inch up to 5-16 inch.....	.65
Plain, 3-16 inch up to ¾ inch.....	1.00
Plain, ¾ inch up to 3-16 inch.....	1.50
Plain, 2 inch up to 3 inch.....	.38
Plain, 3 inch and larger.....	Special.
Plain, smaller than ¾ inch.....	Special.
Bronze and Copper.....	3¢ advance.

Roll and Sheet Brass. (100 lb lots).  
Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99%  
Pure) in ingots for remelting.  
Small lots..... ½ lb, 40¢  
100-lb lots..... ½ lb, 36¢  
No. 2 (guaranteed over 90% pure).  
Small lots..... ½ lb, 34¢  
100-lb lots..... ½ lb, 33¢  
Nickel Aluminum Casting Metal.  
Small lots..... ½ lb, 39¢  
100-lb lots..... ½ lb, 35¢  
Special Casting Alloy, with over 80%  
pure Aluminum used in place of brass.  
Small lots..... ½ lb, 35¢  
100-lb lots..... ½ lb, 30¢  
Aluminum Rolled Rods, from ¾ to 1  
inch diameter..... ½ lb, 53¢  
Aluminum Drawn Rods, from 1-16 to 1  
inch diameter..... ½ lb, 55¢  
Aluminum Plates and Sheets, B. & S.  
gauge.

In lots of 50 lb or more. Less quanti-  
ties, 5¢ ½ lb additional.

	6-in.	14-in.	24-in.
Wider than.....	½ lb, 35¢	½ lb, 35¢	½ lb, 35¢
And including.....	14-in.	16-in.	30-in.
	½ lb, 35¢	½ lb, 35¢	½ lb, 35¢
Nos. 13 to 19.....	\$0.38	\$0.40	\$0.43
" 20.....	.40	.40	.45
" 21 to 23.....	.42	.42	.47
" 24.....	.42	.44	.49
" 25.....	.43	.45	.50
" 26.....	.43	.46	.55
" 27.....	.44	.48	.58
" 28.....	.44	.50	.60
" 29.....	.45	.52	.65
" 30.....	.46	.54	.73

Slab Spelter—  
Western Spelter.....4¼@4½¢

Sheet Zinc—  
600-lb casks.....5¾¢  
800-lb casks.....5.95¢  
Loose sheets.....6¢

Solder—  
Half and Half (50 x 50).....11¢  
45/55.....10¢  
Extra Wiping.....9½¢  
The prices of the many other qualities of  
Solder in the market indicated by private  
brands vary according to composition.

Antimony—  
Cookson.....8¾@9¢  
Hallett's.....8¼@8½¢

Lead—  
Soft Pig Lead.....4¢  
Bar.....5¢  
Sheet.....6¢

Leader Pipes—  
Corrugated.....80&10¢

Eave Troughs—  
Galvanized.....80&25¢  
IC Terne.....75&5¢  
IX Terne.....75&5¢  
Double Bead Galvanized Lap Joint.....80&25¢  
Double Bead Galvanized Slip Joint.....80&25¢  
Double Bead IC Terne Lap Joint.....75&5¢  
Double Bead IX Terne Lap Joint.....75&5¢

Elbows—  
Adjustable Tin.....70¢  
Spiral.....50&10¢  
Plain Tin.....70¢  
Plain Galvanized.....70&5¢

Valleys—  
Galvanized.....75&5¢  
IC Terne.....70&15¢  
IX Terne.....70&15¢

Cutters—  
Galvanized Roof.....80¢  
Galvanized Quarter Circle, O. G. and  
Box.....80¢

Furnace Fittings—  
Discount from Excelsior Steel Fur-  
nace Co.'s revised list  
25%, f.o.b. Chicago.

Steel Roofing—  
Perfection.....\$2.25 square  
Climax.....2.20 square  
The Lloyd Spanish Tiling... 4.50 square  
W. J. Burton & Co.'s Roll Cap 3.00 square  
Subject to discount.

Metallic Shingles—  
Cushman's.....dis. \$2.35  
Merchant & Co.'s Gothic Shingles.  
10 x 14 14 x 20  
IC Tin. ½ square, \$4.75 \$4.50  
Galv..... ½ square, 6.25 5.75

Merchant & Co.'s Spanish Tiles—  
Copper, 12 oz., 14 x 20, \$35.50 square  
Tin IC, 14x20, \$8.00 @ \$14.25 square  
Steel, painted, 14 x 20...\$7.50 square  
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—  
\$4.00 square; IC Tin, \$4.25; Octagon  
Fluted Steel, \$4.50; IC Tin, \$5.00;  
Gothic Tile, Tin, \$9.00; subject to  
discount.

Berger's Spanish Tiles—  
Copper, 12 oz., 14 x 20...\$25.50 square  
IC Tin, 14 x 20..... 8.00 square  
Steel Painted, 14 x 20... 7.50 square

Cortright's Metal Slates—  
14 x 20.....\$5.25 square  
10 x 14..... 5.50 square  
7 x 10..... 6.50 square

Cortright's Victoria Shingles—  
10 x 14.....\$6.75 square  
7 x 10..... 8.50 square  
Subject to discount.

Drain Pipe—Tile.  
Discount from list.....50%

Paints, Oils, &c.  
Deodorized Benzine.....8 @ 12¢  
Iron Paint, Bright Red..... ½ lb 2 ¢  
" " Brown..... ½ lb 1½¢  
" " Purple..... ½ lb 2½¢  
" " Ground in oil, B. Red, ½ lb 6½¢  
" " Ground in oil, Red, ½ lb 6½¢  
" " Ground in oil, Brown, ½ lb 5½¢  
" " Ground in oil, Purple, ½ lb 6½¢  
Linseed Oil, Boiled, in bbls.....43¢  
Linseed Oil, Raw, in bbls.....41¢  
Mineral Paints.....1 @ 1¢  
Orange Mineral.....12¢  
Pure White Lead in Oil.....5½ @ 6 ¢  
Dry White Lead in bbls.....5 @ 5½¢  
Red Lead, American.....5¼ @ 5½¢  
Red, Venetian, English, dry.....1¼ @ 1½¢  
Red, Venetian, in oil, asst'd cans.....8 ¢  
kegs. 3 to 6 ¢  
Sipe's Japan Oil, in bbls, ½ gal......34¢  
Spirits Turpentine, in bbls, ½ gal.....40¢  
Asphaltum, Trinidad Refined, ½ ton.....\$1.25  
Tarred Felt, 1 Ply, ½ roll 108 sq. feet 90¢  
Tarred Felt, 2 Ply, ½ roll 108 sq. feet 90¢  
Tarred Felt, 3 Ply, ½ roll 108 sq. feet.....\$1.25  
Roofing Pitch, ½ bbl of 300 lb.....\$3.00



## NEW YORK, MARCH 11.

The following quotations are for small lots:

## Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.	40¢
Small lots.	40¢
100-lb lots.	38¢
Aluminum Rods, from 1/4-in. diam. to 1 in. diam.	53¢
Aluminum Sheet, 16 & 24 gauge.	50¢
In lots of 50 lbs or more.	
Wider than..... 6-in. 14-in. 24-in.	
And including..... 14-in. 24-in. 30-in.	
Nos. 13 to 19.....	\$0.38 \$0.40 \$0.43
" 20.....	.40 .42 .45
" 21 to 23.....	.42 .44 .47
" 24.....	.42 .46 .49
" 25.....	.43 .47 .50
" 26.....	.43 .50 .55
" 27.....	.44 .53 .58
" 28.....	.44 .53 .80
" 29.....	.45 .56 .85
" 30.....	.46 .60 .73

Note.—Lots of less than 50 lbs 5¢ per lb extra.

## Antimony—

Cookson.....	81¢
Hallett's.....	79¢
Japanese.....	73¢

## Brass—Planished..... net

Roll and Sheet..... 35¢ off

## Brass and Copper Tubes

## Braze Brass Tubing—

Brown &amp; Sharpe's Gauge the Standard.

List Feb. 26, 1896.

Plain Round Tube.	Per m.
1/4-in. up to 2-in.	\$0.35
2-in. up to 3-in.	.38
3-in. up to 4-in.	.38
4-in. up to 5-in.	.41
5-in. up to 6-in.	.48
6-in. up to 8-in.	.65
8-in. up to 10-in.	1.00
10-in. up to 12-in.	1.50
Smaller than 1/4-in.	Special
8-in. and larger.	Special
2-in. to 3-in., to No. 19, inclusive.	38¢

## Copper &amp; Bronze Tubing—

3¢ per lb more than Brass.

## Conductors—

## Corrugated. Round or Square.—

Galvanized, Nested.....	80%
" Not Nested.....	80%
" Locked Joints, Nested.....	80%
" Not Nested.....	80%
Tin.....	70%

## Spiral Riveted.

Galvanized..... 50%

See also Eave and Shoe, Eave Trough Miters, Strainers, Conductor.

## Conductor Strainers—See

Strainers, Conductor.

## Copper—

Bottoms, Pits and Flats 18¢ @ 10¢ basis

Ingot.

Lake..... 124¢

Ansonia Grade Casting..... 11¢

Planished..... net

Sheet and Bolt..... 15¢ per lb basis

## Tubes—See Seamless Brass Tubes.

## Eave Troughs—

List Feb. 1, 1895.

Lap or Slip Joint, Galvanized..... 80% &amp; 10%

Lap or Slip Joint, Terne..... 65%

## Eave Trough Miters—

Lap or Slip Joint..... list, 25%

## Elbows—Plain Adjustable—

Tin..... 70% &amp; 10%

Galvanized..... 80%

## Crimped Tubing.

Retinned or Galvanized..... 85%

## Stove Pipe—

Buffalo Four-Piece.....

No. 1, \$0.70 77 89 87 1.05 per doz.

No. 2, .61 .68 .71 .74

## Elbows and Shoes—

Flat Crimp..... 35%

Galvanized..... 35%

## Corrugated. Flat Crimp.

Galvanized..... 70% &amp; 5%

## Round or Square.

Tin..... 70% &amp; 5%

Galvanized..... 70% &amp; 5%

## Gasoline—See Petroleum Products.

## Iron, Sheet—Black.

Common R. G. Cleaned

American.

Nos. 10 to 16..... 2.30

Nos. 17 to 21..... 2.35

Nos. 22 to 24..... 2.45

Nos. 25 and 26..... 2.55

No. 27..... 2.65

No. 28..... 2.75

American B. B..... 2.45

Russia, Planished, &amp;c.

Genuine Russia, accord-

ing to assortment..... 10¢ @ 10¢

No. Stained..... 8¢ @ 10¢

Patent Planished 1/4 in. A. 9¢; B. 8¢; C. 7¢

Crab Polished Sheet Steel..... 5¢

## Galvanized.

Nos. 10 to 16.....	12¢
Nos. 17 to 21.....	13¢
Nos. 22 to 24.....	14¢
Nos. 25 to 26.....	15¢
No. 27.....	16¢
No. 28.....	17¢
No. 29.....	18¢
No. 30.....	21¢

38 in. 1¢ per lb higher

## Kerosene—See Petroleum Products

## Lead—

American Pig.....	4 1/2¢ @ 4 1/2¢
Bar.....	3¢
Pipe.....	5 1/2¢ @ 20%
Tin Lined Pipe.....	12 1/2¢ @ 20%
Block Tin Pipe.....	30¢ @ 20%
Sheet.....	6 1/2¢ @ 20%
Old Lead in exchange, 3 1/2¢ per lb.	

## Mitres, Eave Trough—See

Eave Trough Mitres.

## Nickel—

Per lb..... 38¢

## Paints, Oils, &amp;c.—

Lead, White, Atlantic and Jewett's.	6¢
100 @ 500 lb.	6¢
Lead, Amn. White in oil.	6¢
Lead, Red, bbls. and 1/2 bbls.	6¢
Lead, Red, kegs.	6¢
Ochre, American.	1 1/2¢
Red Venetian, American.	1 1/2¢
Linseed Oil:	
Boiled, gal.	45¢ @ 46¢
Spirits Turpentine:	
In bbls.	38¢
In cases.	44¢

Putty:

In barrels and 1/2 bbls..... 1 1/2¢ @ 2¢

In tubs..... 1 1/2¢ @ 2¢

In tin cans..... 2 1/2¢ @ 3¢

In bladders..... 2¢ @ 2 1/2¢

## Palm Oil. 1500 lb casks.

Fancy Lagos..... 5 1/2¢

Clarified..... 5¢

Acres..... 4 1/2¢

Half Jack..... 4 1/2¢

Cecilia..... 100 lb \$4.50

Choice Red..... 100 lb \$4.00

(Spot Oil, 1/2¢ per lb higher.)

## Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline..... gal. 10¢ @ 11¢

Kerosene..... gal. 8¢

## Pipe, Drain.

## Pipe, Spiral—

Galvanized..... 60%

Tin..... 60%

## Plumbers' and Steam

## Fitters' Supplies—

List of June 1, 1896.

## Fittings—

Cast Iron Fittings, Black and Galva-

nized, Standard sizes..... 75%

Cast Iron Fittings, Bushings and

Plugs..... 75%

Cast Iron Fittings, Flanges..... 75%

Malleable Iron Bushings..... 75%

Unions..... 75%

American Unions..... 40%

Wrought..... 75%

Nipples..... 75%

Couplings..... 70%

Long Screws..... 70%

Fittings..... 50%

## Valves, Cocks, &amp;c.—

Iron Body Valves..... 75%

All Iron Valves..... 70%

Air Cocks and Radiator Air Cocks..... 70%

Soldering Unions..... 70%

Nipples..... 70%

Jenkins' Iron Body Valves, except

Gate Valves..... 65%

Jenkins' All Iron Valves, except

Gate Valves..... 60%

Jenkins' Iron Body Gate Valves..... 60%

All Iron Gate Valves..... 60%

Iron Cocks, all Iron..... 70%

with Brass Plugs..... 60%

Brass Globe, Angle and Cross Valves..... 70%

and Angle Valves, hose

outlet..... 70%

Brass Garden Hose Valves..... 70%

Horizontal, Vertical and Angle

Check Valves..... 75%

Brass Safety Valves..... 70%

Low Pressure..... 70%

Radiator Valves..... 70%

Jenkins' Globe, Angle, Cross

Corner, Safety and Check Valves..... 65%

Brass Jenkins' Gate Valves..... 80%

Steam Cocks..... 75%

Gas Meter and Union Meter

Cocks..... 70%

Brass Fittings, Rough..... 70%

Finished..... 65%

Bushings..... 65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough..... 70%

Finished..... 65%

Compression Work..... 65%

Chain Stays..... 60%

Iron Boiler Couplings, Ground Face,

per set, \$1.00..... net

Basin Plugs..... 65%

Sink or Bath and Wash Tray Plugs..... 65%

Basin Clamps..... 60%

Plumbers' Joy, 50¢ per

doz..... net

## Bath Tubs—

Copper Lined Bath Tubs.....	50%
Steel Clad Copper Lined Bath Tubs.	
List of Oct. 20, 1897.....	40% & 10%
Porcelain Lined Iron Bath Tubs, list	
of Aug. 15, 1896.....	40%
Steel Clad Enamel Bath Tubs, list of	
Oct. 20, 1897.....	50%

## Boilers—

Galvanized Iron Range Boilers to and	
including 52 gallons.....	75%
Galvanized Iron Range Boilers above	
52 gallon.....	65%
N. B.—5¢ extra on Standard 30, 35	
and 40 gal. Boilers.	
Galvanized Iron Range Boilers, Extra	
Heavy, to and including 52 gallon.....	70%
Galvanized Iron Range Boilers, Extra	
Heavy, above 52 gallon.....	60%

## Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....	70%
" " Extra Heavy.....	75%
" " Fittings.....	75%
" " Sinks, Plain.....	80%
" " Galvanized.....	80%
" " Backs Plain.....	80%
" " Galvanized.....	80%
" " Legs Plain.....	80%
" " Galvanized.....	80%
" " Backs with air cham-	
bers, Plain.....	80%
Cast Iron Sinks, Backs with air cham-	
bers Galvanized.....	80%

## Miscellaneous.

Earthenware, List of Dec 5, 1895.....	60%
Drawn Lead Traps, List of Aug. 2,	
1897.....	50%
Palmer's Improved Horizontal Back	
Water Sewer Valves.....	35%
Climax Soil Pipe Testing Plugs.....	50%

## Registers—

List Dec. 20, 1897.

Black Japanned.....	40% & 10%
White Japanned.....	30% & 10%
Nickel Plated.....	40% & 10%
Bronze Finishes in imitation of Gold	
Silver, Copper or Bronze.....	40%
Electroplated in Brass, Bronze or	
Copper.....	40%

## Rock and Slag Wool—

Slag Wool, ordinary.....	1 1/2¢
Slag Wool, extra.....	38¢
Rock Wool, ordinary.....	2 1/2¢
Rock Wool, extra.....	45¢

## Roofing Material—

Asphaltum, Trinidad Refined.....	\$30.00 @ \$35.00
Asphaltum, Rock.....	\$14.00
Coal Tar Felt, 1 ply.....	2¢
2 Ply Roofing, roll, 108 sq. ft.....	\$1.00
3 Ply Roofing, roll, 108 sq. ft.....	1.35
Roofing Pitch, per bbl.....	\$3.40 @ \$3.50

## Rosin—

Common and Good—Strained.	
Rosin, C. & D.....	per bbl. \$1.48 @ \$1.49
Rosin, E. & F.....	per bbl. 1.55 @ 1.60
Rosin, G. & H.....	per bbl. 1.70 @ 1.80
Rosin, I. & K.....	per bbl. 1.85 @ 1.90
Rosin, M. & N.....	per bbl. 2.10 @ 2.20

## Seamless Brass Tubes—

Net List, Feb. 1, 1897.

## Shoes and Elbows—See EL-

bows and Shoes.

## Slate Roofing—

According to size, f. o. b. cars, Quarry

Station.

## Pennsylvania:

Best Bangor, per sqr.....	\$8.50 @ \$4.50
No. 1 Bangor Ribbon.....	8.00 @ 8.25
Pan Argyie, per sqr.....	8.25 @ 8.50
Peach Bottom, per sqr.....	7.75 @ 8.00
No. 1 Chapman, per sqr.....	8.00 @ 4.25
Lehigh Slates, per sqr.....	8.25 @ 3.80

## Vermont:

Sea Green, per sqr.....	\$2.45 @ \$3.05
Purple, per sqr.....	8.75 @ 4.00
Variegated Purple.....	2.25 @ 2.90
Unfading Green, per sqr.....	3.50 @ 4.00
Red, per sqr.....	8.50 @ 10.50

## Solder and Soldering

## Fluids— Solder—

1/2¢ guaranteed..... 10¢ @ 10¢

No. 1..... 9¢ @ 10¢

Prices of Solder indicated by private

brands vary according to composition.

## Soldering Fluids—

Acme Soldering Fluid..... 60¢

Concentrated Soldering Fluid.....

f. o. b. New York.

In barrels..... 4¢

Smaller quantities..... 5¢

## Gedney's Soldering Fluid.

In carboys or barrels..... 2¢

1.50 for carboy or barrel; money re-

funded when returned.

## Perfection Soldering Fluid.

No charge for package.

Bbls. about 500 lb..... 3¢

1/2 bbls. about 300 lb..... 4¢

Kegs, about 110 lb..... 4¢

75¢ extra for keg.

Kegs about 55 lb..... 4¢

## Yager's Soldering Salts.

1/2 lb bottles, each.....	80¢
Large quantities, per lb.....	40¢



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Adriance Machine Works... 75	Cope, Geo. W..... 21	Highton, Wm. & Son..... 18	Mowry, W. C..... 19	Sheppard, Isaac A. & Co..... 1
Etna-Standard Iron & Steel Co..... 68	Cortright Metal Roofing Co.. 68	Hill, Whitney & Wood Co... 26	Munsell, E. & Co..... 18	Sherman, J. S..... 25
American Corrugating Co.. 68	Cory, U. & Co..... 19	Hoffman, Geo. W..... 21	National Pipe Bending Co.. 17	Simonds Furnace Co..... 16
Apollo Iron & Steel Co. .... 1	Crawford & Young..... 25	Holton Iron Roofing Co..... 68	New York Iron Roofing & Corrugating Co..... 68	Smith Co., H. B..... 19
Arcade Mfg. Co..... 28	Curtis & Curtis..... 23	Howard Furnace Co. .... 30	Niagara Machine & Tool Wks 71	Smith, W. A. & Co..... 63
Atlanta Steel & Tin Plate Co. 66	Detroit Smelting & Refining Co..... 61	Howard Thermostat Co..... 14	Northern Refrigerator Co.. 26	Souther, E. E. Iron Co..... 70
Baker, J. R. Co..... 63	Dixon, Jos. Crucible Co.. .. 63	Howson & Howson... .. 62	Northrop, H. S..... 70	Special Notices..... 61
Bangor Excelsior Slate Co.. 57	Double Truss Cornice Brake Co..... 71	Illinois Pure Aluminum Co.. 26	Ohl, Geo. A. & Co..... 74	Sperry, D. R. & Co..... 28
Barstow Stove Co..... 76	Drake, W. H..... 19	International Correspondence Schools..... 61	Osborn, J. M. & L. A. .... 66	Stebbins, E. Mfg. Co..... 22
Beaver Tin Plate Co..... 65	Eastwood Wire Mfg. Co.... 1	Iron City Mfg. Co..... 68	Ostrander, W. R. & Co..... 62	Stiles, E. S. Press Co..... 72
Beckwith, P. D., Estate of.. 9	Eddy Electric Mfg. Co ..... 25	I. X. L. Beer Pump Co..... 23	Palmer I. E..... 29	Stiles & Parker Press Co.... 74
Bell, W. C..... 74	Eller, J. H. & Co..... 69	Jackson's Sons, W..... 19	Parks & Parks..... 20	Stocking, E. B..... 62
Berger Bros. Co..... 64	Ellwood Tin Plate Co..... 70	Jenkins Bros..... 1	Paxton Hdw. Mfg. Co..... 64	Sykes Iron & Steel Roofing Co..... 68
Berger, L. D..... 62	Ely, C. Upham..... 25	Johns, H. W. Mfg. Co..... 20	Pease, J. F., Furnace Co.... 4	Taylor Co., N. & G..... 76
Berger Mfg. Co..... 69	Energy Mfg. Co..... 25	Johnson, E. J. & Co..... 70	Peck Bros. & Co..... 22	Thorn Shingle & Ornament Co..... 7
Bergstrom Bros. & Co. .... 14	Excelsior Steel Furnace Co. 14	Kansas City Metal Roofing & Corrugating Co..... 68	Peck, Stow & Wilcox Co.... 73	Tinners' Machinery & Supply Co..... 73
Bertsch & Co..... 74	Follansbee Bros. Co..... 70	Keen & Hagerty Mfg. Co.... 29	Philadelphia Steel Roofing Co..... 66	Toledo Mch. & Tool Co..... 72
Bibb, B. C. Stove Co..... 18	Forest City Fdry. & Mfg. Co. 21	Keene, Geo. C. & Co..... 75	Phillips & Clark Stove Co.. 10	Troy Nickel Works ..... 20
Bliss, E. W. Co..... 74	Frاند, M. J. & Co..... 63	Kellogg, Mackay, Cameron Co..... 17	Pierce, Butler & Pierce Mfg Co..... 17	Tubular Heating & Ventilating Co..... 5
Blumer-Doscher Mfg. Co.... 63	Franke, H..... 20	Kelly, Thos. & Bro..... 22	Pocock, Oliver..... 70	Tucker & Koester..... 27
Bowen Mfg. Co..... 27	Friedley & Voshardt..... 63	Kelsey Furnace Co..... 12	Porsch, John..... 24	Valentine, M. D. & Bro. Co.. 21
Bowers, L. M. & Co..... 63	Erink, I. P..... 76	Kemp, C. M. Mfg. Co..... 22	Poorman Mfg. Co..... 27	Van Range Co., John..... 11
Brand Stove Co..... 16	Front Rank Steel Furnace Co..... 17	Kernan Furnace Co..... 13	Portsmouth Stove & Range Co..... 12	Vance Steam Boiler Works.. 19
Brauer, A. G..... 61	Galt, John & Sons..... 70	Kieckhefer Bros. Co..... 29	Putnam Foundry & Machine Co..... 15	Vanderman Plumbing & Heating Co..... 24
Bray, J. & Co..... 70	Garry Iron & Steel Roofing Co..... 68	Kieley, T..... 1	Presbrey Stove Lining Co.. 21	Vedder Pattern Works .... 21
Brombacher's Sons, Jacob... 72	Giblin & Co..... 16	Koven, L. O. & Bro..... 20	Rasner & Dinger..... 62	Vogel, William & Bros ..... 25
Bruce & Cook ..... 67&76	Globe Ventilator Co..... 64	Lalace & Grosjean Mfg. Co. 28	Republic Iron Works..... 66	Washburne, E. G. & Co.. 64&66
Burgess Soldering Furnace Co..... 23	Gobelle Pattern Co. .... 21	Landers, Frary & Clark... 22	Reymond & Gottlob..... 66	Weir Stove Co..... 76
Burritt, O. W. & Bro. .... 71	Goodrich, Judson A. Co..... 1	Lawrence-Letts Elbow Co.. 21	Richmond Stove Co..... 14	West Mfg. Co..... 73
Burton, W. J. & Co..... 67	Gordon, W. J..... 75	Littleford Bros..... 62	Ringen Stove Co..... 2	Wheeler, E. S. & Co..... 1
Cambridge Roofing Co..... 68	Gorton & Ldgerwood Co... 1	Lyon, Conklin & Co..... 72	Robinson, J. M. & Co..... 75	Wheeler, Russel & Son..... 5
Campagna, Eugene W..... 19	Graff & Co..... 11	McClure & Co..... 76	Rochester Stamping Works.. 62	Whelan, D. J..... 73
Canton Steel Roofing Co.... 68	Greene, W. F..... 21	McCullough Iron Co..... 67	Rockford Grate Co..... 15	White Mfg. Co..... 75
Carton Furnace Co..... 3	Griffing, A. A. Iron Co..... 17	Magee Furnace Co..... 1	St. Louis Stamping Co..... 28	White-Warner Co..... 1
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Cincinnati Corrugating Co.. 69	Gurney Heater Mfg. Co..... 13	Marston, I. G. & Co..... 22	Sanitary Mfg. & Enameling Co..... 23	Wilson, F. Cortez & Co..... 24
Cleveland Fdy. Co..... 8	Gurney Refrigerator Co.... 26	Meurer Bros. Co..... 65	Saunders, D. Sons..... 23	Wilson, R. M. Mfg. Co..... 24
Cleveland Gas Machine Co.. 24	Halliday, M..... 63	Miller, Chas. & Son..... 76	Schneider & Trenkamp Co.. 6	Wister, L. & R. & Co..... 76
Clough, R. M..... 74	Hanson, F. B..... 23	Miner & Peck Mfg. Co..... 75	Schratwiesers Metal Lath Works..... 70	Wood, Alan Co..... 67
Coe, Jas. A. & Co..... 65		Mitchell Heater Co..... 17	Schwerdtle & Siebert..... 71	Wood Co., W. Dewees..... 76
Colt, J. B. & Co..... 18		Monarch Stove & Mfg. Co.. 7		Zucker & Levett & Loeb Co.. 25
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**McClure & Co.,** Pittsburgh, Pa.  
**Meurer Bros. Co.,** Brooklyn, N. Y.  
**Sanborn, J.,** 217 Water St., N. Y.  
**Taylor, N. & G. Co.,** Philadelphia, Pa.

**Soldering Furnaces.**

**Burgess Soldering Furnace Co.,** Columbus, Ohio.

**Speaking Tubes and Whistles.**

**Ostrander, W. R. & Co.,** 204 Fulton St., N. Y.

**Specialties, Sheet Metal.**

**Vogel, Wm. & Bros.,** Brooklyn, N. Y.

**Stamped Ware, Aluminum.**

**Illinois Pure Aluminum Co.,** Lemont, Ill.

**Steam and Gas Filters' Supplies.**

**Curtis & Curtis, Bridgeport, Conn.**  
**Kleley, T.,** 7-11 West 13th St., N. Y.

**Steel Stamps and Stencil Dies.**

**Schwerdtle & Siebert, Bridgeport, Ct.**

**Stove Linings.**

**Marcy Stove Repair Co.,** 74 Beekman St., N. Y.  
**Presbrey Stove Lining Co.,** Taunton, Mass.  
**Valentine, M. D. & Bro. Co.,** Woodbridge, N. J.  
**Williams Stove Lining Co.,** Taunton, Mass.

**Stove and Metal Polish.**

**Hoffman, Geo. W.,** Indianapolis, Ind.

**Stove Patterns.**

**Cope, G. W.,** Detroit, Mich.  
**Gobelle Pattern Co.,** Cleveland, O.  
**Vedder Pattern Works, Troy, N. Y.**

**Stove Pipe.**

**Berger Bros. Co.,** Phila., Pa.  
**Marlin & Co.,** Pittsburgh, Pa.

**Stove Pipe Collars.**

**Paxton Hdw. Co.,** Paxton, Ill.

**Stove Pipe Thimbles.**

**Cheney, S. & Son, Manlius, N. Y.**

**Stove Polishing Mitten.**

**Parks & Parks, Troy, N. Y.**

**Stove Putty.**

**Connors, Wm.,** Troy, N. Y.

**Stove Repairs.**

**Brauer, A. G.,** St. Louis, Mo.  
**Marcy Stove Repair Co.,** 74 Beekman St., N. Y.  
**Troy Nickel Works, Troy, N. Y.**

**Stove Trimmings, &c.**

**Arcade Mfg. Co.,** Freeport, Ill.  
**Greene, W. F.,** Troy, N. Y.  
**Troy Nickel Works, Troy, N. Y.**

**Stoves and Ranges.**

**Beckwith, P. D.,** Est. of, Dowagiac, Mich.  
**Bergstrom Bros. & Co.,** Neenah, Wis.  
**Bibb, B. C. Stove Co.,** Baltimore, Md.  
**Brand Stove Co.,** Milwaukee, Wis.  
**Graff & Co.,** 208 Water St., N. Y.  
**Magee Furnace Co.,** Boston, Mass.  
**Phillips & Clark Stove Co.,** Geneva, N. Y.  
**Portsmouth Stove & Range Co.,** Portsmouth, N. H.  
**Richmond Stove Co.,** Norwich, Ct.  
**Ringen Stove Co.,** St. Louis, Mo.  
**Schneider & Trenkamp Co.,** Cleveland, Ohio.  
**Sheppard, Isaac A. & Co.,** Phila., Pa.  
**Van, John, Range Co.,** Cincinnati, O.  
**Weir Stove Co.,** Taunton, Mass.  
**White-Warner Co.,** Taunton, Mass.

**Stoves and Ranges, Gas.**

**Grissold Mfg. Co.,** Erie, Pa.  
**Ringen Stove Co.,** St. Louis, Mo.

**Stoves and Ranges, Oil, Vapor and Gasoline.**

**Barstow Stove Co.,** Providence, R. I.  
**Cleveland Foundry Co.,** Cleveland, O.  
**Monarch Stove & Mfg. Co.,** Mansfield, Ohio.  
**Rack Stove Co.,** St. Louis, Mo.  
**Schneider & Trenkamp Co.,** Cleveland, Ohio.

**Tea Kettles.**

**Hill-Whitney & Wood Co.,** Boston, Mass.  
**Rochester Stamping Wks.,** Rochester, N. Y.

**Tea Pots.**

**Rochester Stamping Works, Rochester, N. Y.**

**Tinners' Tools, Machines, and Supplies.**

**Berger, L. D.,** Philadelphia, Pa.  
**Berger Bros. Co.,** Phila., Pa.  
**Bertsch & Co.,** Cambridge City, Ind.  
**Bliss, E. W. Co.,** Brooklyn, N. Y.  
**Brombacher, A. F. & Co.,** 31 Fulton St., N. Y.  
**Bruce & Cook, 186 to 190 Water St.,** New York.  
**Follansbee Bros. Co.,** Pittsburgh, Pa.  
**Keene, Geo. C. & Co.,** Cincinnati, O.  
**Lindas, H.,** Edgerton, Wis.  
**Niagara Machine & Tool Wks.,** Buffalo, N. Y.  
**Ohl, Geo. A. & Co.,** Newark, N. J.  
**Peck, Stow & Wilcox Co.,** 27 Murray St., New York.  
**Stiles & Parker Press Co.,** Brooklyn, N. Y.  
**Tinners' Machinery & Supply Co.,** 26 Cliff St., N. Y.  
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**Tinners' Trimmings.**

**Vogel, Wm. & Bros.,** Brooklyn, N. Y.

**Tin Plate. (Mfrs. of.)**

**Atna-Standard Iron & Steel Co.,** Bridgeport, O.  
**Atlanta Steel & Tin Plate Co.,** Atlanta, Ind.  
**Beaver Tin Plate Co.,** Lisbon, Ohio.  
**Berger, L. D.,** Philadelphia, Pa.  
**Bruce & Cook, 186 to 190 Water St.,** New York.  
**Coe, Jas. A. & Co.,** Newark, N. J.  
**Ellwood Tin Plate Co.,** Ellwood City, Pa.  
**Follansbee Bros. Co.,** Pittsburgh, Pa.  
**Gumme, McFarland & Co.,** Phila., Pa.  
**Lyon, Conklin & Co.,** Baltimore, Md.  
**McClure & Co.,** Pittsburgh, Pa.  
**Meurer Bros. Co.,** Brooklyn, N. Y.  
**Morton Tin Plate Co.,** Cambridge, Ohio.  
**Osborn, J. M. & L. A.,** Cleveland, Ohio.  
**Taylor, N. & G. Co.,** Philadelphia, Pa.

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**Dover Stamping Co.,** Boston, Mass.  
**Keen & Hagerty Mfg. Co.,** Baltimore, Md.  
**Kleinhefer Bros. Co.,** Milwaukee, Wis.

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**Saunders, D. Sons, Yonkers, N. Y.**

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**Eastwood Wire Mfg. Co.,** Belleville, N. J.  
**Goodrich, Judson A. Co.,** 120 Beekman St., N. Y.  
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**Globe Ventilator Co.,** Troy, N. Y.  
**Meurer Bros. Co.,** Brooklyn, N. Y.  
**Washburne, E. G. & Co.,** 46 Cortlandt St., New York.

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**Keen & Hagerty Mfg. Co.,** Baltimore, Md.

**Washers, Valves, &c.**

**Littleford Bros.,** Cincinnati, O.  
**Marston, I. G. & Co.,** Boston, Mass.

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**Colwell Lead Co.,** 63 Centre St., N. Y.  
**Kelly, Thos. & Bros.,** Chicago, Ill.  
**Peck Bros. & Co.,** New Haven, Conn.

**Water Heaters.**

**Kemp, C. M. Mfg. Co.,** Baltimore, Md.

**Wind Gates.**

**Miner & Peck Mfg. Co.,** New Haven, Ct.

**Wiping Cloths.**

**Porsch, John, Erie, Pa.**

SEE ALPHABETICAL INDEX, PAGE 57.

# THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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**Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.**

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

## HELP WANTED.

First-class CORNICE MAKERS and TIN ROOFERS. Currie Hardware Company, 1216-1218 Atlantic avenue, Atlantic City, N. J. March 12

A man with good executive ability, who has had experience in a large stamped ware factory, where tin and steel ware for enameling are made, and a large number of hands are employed; one accustomed to supervising the making of machinery and dies, and capable of superintending; must be temperate; state age, experience, salary; applications will be treated as confidential. Address "Stamped Ware," office of *The Metal Worker*, 232-238 William street, New York City. March 12

A TINSMITH on assortment work in tin factory; to board with employer; a Catholic sober, single young man with some knowledge of plumbing. M. Mond, Ozone Park, L. I., N. Y. March 12

Experienced HOLLOW WARE MOLDER, as assistant foreman; also PATTERN MAKER in steel. "Hollow," office of *The Metal Worker*, 232-238 William street, New York City. March 12

A good reliable man capable of first-class work at either tinning or plumbing; married man preferred; steady job. Box 23 Aurora, N. Y. March 12

A FOUNDRY FOREMAN for a gray iron shop employing 60 molders, about half of whom are bench molders and the remainder floor molders; in reply give age, experience, recent employers and ability for turning out work cheaply. "V. V.," office of *The Metal Worker*, 232-238 William street, New York. Mar. 5

At once, several good SHEET METAL WORKERS. Address, with particulars, U. S. Head-Light Company, Utica, N. Y. Mar. 5

A SALESMAN in New York City, now visiting the building trade in the interests of hot water and steam goods; to also handle a very marketable line of ranges; new goods just brought out. "Western," office of *The Metal Worker*, 232-238 William street, New York City. Mar. 5

A young single man who has served an apprenticeship at the tinners' trade, and who understands something about working in a hardware store; must give recommendations as to honesty and speak English and German; steady job to right man; must be a hustler. G. B. Lahr, Juda, Wis. Mar. 5

SALESMAN thoroughly acquainted with tin plate and metal trade, by New York wholesale house. Address, giving references and experience, "Competent," office of *The Metal Worker*, 232-238 William street, New York City. Mar. 5

An AI PLUMBER, TINNER, STEAM and HOT WATER FITTER; must be perfectly temperate and must have first-class references; state wages; to the right man steady work. P. E. Fraleigh, Red Hook, N. Y. Mar. 5

A first-class TINNER at inside and outside work; must understand bicycle repairing, wood and iron pump, wind mill work; also be able to clerk in store if required; none but first-class men need apply. Apply with references and wages wanted. Howell & Co., Woodhull, Ill. Mar. 5

## SITUATIONS WANTED.

By PLUMBER and GAS FITTER, city or country; first-class mechanic; wages moderate. Albert Dorer, 491 Tenth avenue, New York City. March 12

By PLUMBER of 12 years' experience; steady employment solicited; can give estimates on plumbing and steam fitting. Geo. A. Wyckoff & Co., Elmira, N. Y. March 12

By first-class all round TINNER of 20 years' experience; considerable knowledge of plumbing and hot water heating; within 200 miles of St. Louis preferred. P. O. Box 81, Edwardsville, Ill. March 12

BOOKKEEPER, 35 years of age; experience in slate and slate roofing business; good estimator and cashier, energetic; highest references, bond. Leidenroth, 953 Myrtle avenue, Brooklyn, N. Y. March 12

By a first-class PATTERN FILER and REPAIRER; some experience at stove pattern fitting; a steady, sober man, well recommended. Frank Brandt, 231 Congress street East, Detroit, Mich. March 12

By a TINSMITH; 12 years' experience in the tin and hardware business; can do inside and outside work; also stove and range work; some knowledge of plumbing and pipe work; steady position; sober and reliable; references furnished. "Tinsmith," Lock Box V., Prattsville, N. Y. March 12

As WATER WORKS SUPERINTENDENT in town of about 6000 or 8000 inhabitants by young married man; best of reference; can do anything from station to office; South or West preferred. "C. E. H.," office of *The Metal Worker*, 232-238 William street, New York City. March 12

By a first-class PLUMBER, GAS and HOT WATER FITTER; trade school graduate; neat lead and brass worker; strictly temperate; used to city and country work. A. J. Plumber, 2421 Sixth avenue, Troy, N. Y. March 12

By a STOVE IRON PATTERN FITTER. "Stoves," office of *The Metal Worker*, 232-238 William street, New York City. March 12

By a young man 24 years of age, who has had nine years' experience at plumbing and gas fitting; temperate, married; willing to go anywhere. G. D. Hancock, 258 Castle street, Geneva, N. Y. March 12

As CLERK by a young man 18 years old; two years' experience as clerk in a hardware store; can give best of reference from last employer; wages moderate. Lock Box 5, Almond, N. Y. March 12

By a PLUMBER, STEAM and HOT WATER FITTER; some knowledge of tinning; 12 years' experience in city and country; married; sober and reliable; reasonable wages; best of reference. Box 276, Mount Carmel, Pa. March 12

By a TINSMITH; a middle-aged workman thoroughly experienced in all branches of country work; practical hot air, water and steam heating systems; good reference; very reasonable arrangements for immediate and permanent employment. "Tinsmith," care of Chas. C. Proffitt, 38 Bleecker street, New York City. March 12

By a man 40 years old; well experienced in the stove, furnace and roofing business; good salesman; best of references. "B.," office of *The Metal Worker*, 232-238 William street, New York City. March 12

By TIN and SHEET IRON WORKER; 20 years' experience; roofing and furnace work; steady work desired at \$2.50 per day. John Shey, 74 Madison street, New York City. March 12

A practical man will be open for engagement as SALESMAN and DRAFTSMAN for a New York heating house by April 1. "A. B. C., No. 312," office of *The Metal Worker*, 232-238 William street, New York City. March 12

As CLERK in hardware store; understand bicycle repairing; 12 years' experience in a large retail hardware house; 31 years of age; can speak the Scandinavian language; AI reference. Lew Matson, Clearlake, La. March 12

As TINNER by a good, steady, sober man 24 years of age; four years' experience; inside and outside work; country town preferred; married. C. A. Wilson, 68 Ash street, Ludlow, Ky. March 12

Steady position by a young man who is a good PLUMBER at new jobbing work, iron pipe, leader, stove and furnace work, steam fitting and bicycle repairing; single, sober and honest; 14 years' experience; wages \$2.25 per day; city or country. "Janitor," 113 Nassau street, New York City. March 12

A young man who has spent five years in stove factory as PAYMASTER and PURCHASING AGENT would like to secure position with some other factory; can furnish best of reference. "J. S.," office of *The Metal Worker*, 232-238 William street, New York City. March 12

As PLUMBER, by young man 22 years of age, single; two and a half years' experience in country; best of reference; strictly temperate; New Hampshire preferred. W. Emerson, South Pittsfield, N. H. March 12

By a man with 16 years' experience in management of stove foundries as SUPERINTENDENT; thoroughly competent to assume entire management of all departments of a stove foundry; a practical molder; understands modern cupola practice and can handle help to advantage; highest references furnished as to character and ability. "Foundry Superintendent," office of *The Metal Worker*, 232-238 William street, New York City. March 12

By a young man as TINNER; five and a half years' experience at inside and outside work; willing to work for moderate wages for a steady job; reference as to honesty and ability. Box 75, Montezuma, Ohio. March 12

Young man 18 years old would like to learn plumber's trade; can give the best of references. S. I. Dayton, Center Moriches, L. I., N. Y. March 12

By a young man 24 years of age, who has had two years' experience at tinning, more outside than inside work; desires to finish trade; can set up all kinds of farm machinery, repair wind engines, pumps and bicycles; good references; wages moderate; can speak German and English. "H. H. K.," Box 233, Greenspring, Ohio. March 12

SHEET METAL WORKER of wide experience; capable of managing a cornice, skylight and tin roofing job from start to finish; able to do any kind of a job in sheet metal, that comes in the shop; thorough knowledge of pattern cutting; first-class mechanic in every sense of the word; age 31. G. S. Carter, general delivery, Elizabeth, N. J. March 12

By a man who has had 14 years' experience at TIN, SLATE, CORNICE and JOB WORK; married and temperate. Box 598, Barnesville, Ohio. March 12

By an all-round TINSMITH; first-class on furnace work, jobbing, roofs, gutters, leaders; also an AI bench hand. Frank Scherer, 177 Seventh avenue, New York City. March 12

By a sober, reliable TINNER of ordinary ability. "Jack the Tinner," Rawson, Ohio. March 12

By young man as TIN and SHEET IRON WORKER; understands all kinds of inside and outside work, roofing and general jobbing; ten years' experience in city and country; sober and reliable; not afraid of work; can be ready for engagement any time after April 10; steady job desired. George Davis, White Plains, N. Y. March 12

Steady job by an inside and outside CORNICE MAKER; a hustler; reasonable wages. "S. T.," 72 Village street, Hartford, Conn. March 12

By a first-class ELECTRO PLATER after March 20; 15 years' experience at all kind of plating; finishes fine white nickel on iron; do fancy work, chandeliers, &c. "S. C.," office of *The Metal Worker*, 232-238 William street, New York City. March 12

With some good house, by a young man who has had six years' experience in general hardware; can furnish reference. "Hustler," 1118 Third avenue, New York City. March 12

By a TINSMITH and good jobbing PLUMBER; city or country. H. Rose, care H. Bloom, 87 Prince street, Boston, Mass. March 12

By a TINSMITH; experienced on furnace work, general jobbing and plumbing repairs; country town south or west of Boston preferred. "Tinsmith, 8 Pembroke street, Somerville, Mass. March 12

Steady job by a first-class TINNER; 20 years experience; can do pipe fitting and bicycle repairing. "A Tinner," Wilmington, Ohio. March 12

By thoroughly experienced MANAGER, BOOKKEEPER and TRAVELING SALESMAN, with long foundry and jobbing experience; capable of taking entire charge; acquainted with Pennsylvania, New Jersey and Delaware trade. "Alexandria," Southeast corner Thirteenth and Sansom street, Philadelphia, Pa. March 12

An experienced ELECTRO-PLATER of nickel, copper, brass and silver, and understanding different kinds of antique finishes, desires situation; have had 14 years' experience and can furnish good reference. "Electroplater," office of *The Metal Worker*, 232-238 William street, New York City. March 12

By a young man, who has some knowledge of plumbing, with a first-class shop, where he can finish trade; can hustle, where honest efforts are appreciated. "Hustler," 1118 Third avenue, New York City. March 12

By a good all around TINSMITH; also a good plumber; city or country. Harry Rosenbloom, 152 East Broadway, New York City. Mar. 5

TINSMITH and FURNACEMAN; seven years' experience; city or country; some knowledge of piping and plumbing; strictly temperate and industrious; desires a steady job; state wages given. Alger A. Cragin, Temple, N. H. Mar. 5

Steady position by a TIN and SHEET IRON WORKER; experience at tin roofing, pump, iron pipe, kitchen boiler connections and inside work; steady and sober; references. Box 246, Cato, N. Y. Mar. 5

A young man of strict integrity and exemplary habits desires a permanent position in a stove, tin or hardware store; ten years' experience; is a practical tinner; capable of taking charge; can furnish bonds if necessary or references of a character as to leave no doubt as to his ability and worthiness; resigned last position. Rodgers, 57 West Fifty-third street, New York City. Mar. 5



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These Patterns are developed on heavy detail paper, and will save their cost many times over.

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"DO YOU want to fill up your foundry by contracting to make and deliver in New York about 2000 ranges per year? Low prices and good work will catch such a man." Address "RANGE FOUNDRY," office of *The Metal Worker*, 232-238 William Street, N. Y.

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The Hardware, Stove and Tin business of the late George Baker of Philmont, N. Y. This is an old established business, and a first-class opening for a live hardwareman. For further particulars address

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An experienced Stove Foundry man with some capital can obtain control of a well established Stove Foundry at one of the best distributing points in the West. This is a rare opportunity for a man with enterprise and some money. Address,

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In writing for prices kindly give description and quantity of scrap.

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**Special Notices.****A Rare Opportunity.**

On account of failing health the owner offers for sale outright a Stove Manufacturing business of more than 30 years' standing, commanding a trade among the very best dealers in Ohio and Indiana. This offer covers a full line of Wood Cooks and Ranges, Coal Cooks and Ranges, also Wood and Coal Heaters. No manufactured stock or real estate is offered. All patterns, follow boards and flasks are in first-class condition and good live working order. Most of best selling patterns have only been in use about three years. Patterns are in active use and on the market and a purchase would include good will of the business. Will sell outright at very great sacrifice, or with proper parties would be willing to retain an interest in the business if desired. For further information address

"STOVES,"

office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, O.

**FOR SALE.** A successful Plumbing, Heating and Tin business in a prosperous country place on Long Island near New York City. Employs three to four men constantly. Will sell outright on easy terms, lease or exchange for good real estate. Reason for selling, poor health. "L. I." office of *The Metal Worker*, 232-238 William St., N. Y.

**FOR SALE.**

I will sell cheap an old established Furnace Range, Roofing and Jobbing shop. On leading business street. I am now manufacturing tinware and cannot attend to both businesses. A good chance for one or two men who understand the business. No charge for good will. Work coming in every day.

JOHN W. WALLACE,  
329 Myrtle Ave., Brooklyn, N. Y.

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The patentee of a new Improved Dustless Register wants to either sell same or interest manufacturers who can make same. This register can be manufactured 8 to 10% less than any other register on the market and has strong selling points over any other.

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**CONTENTS:**

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea Kettles; Oval Tea Kettles; Beer Mullers; Funnels; Coffee Pots; Saucepans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warm-ing Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tiches; Stills.

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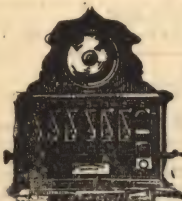
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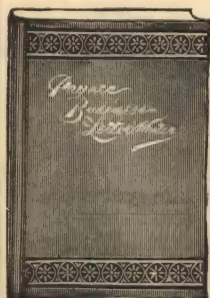
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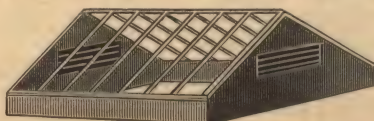
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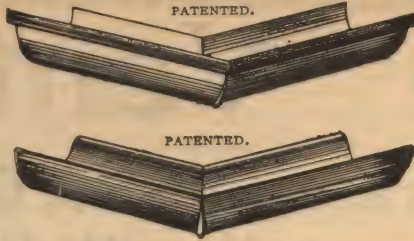
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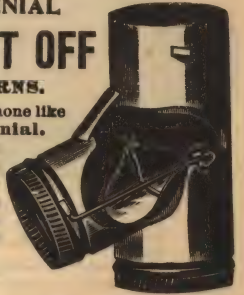
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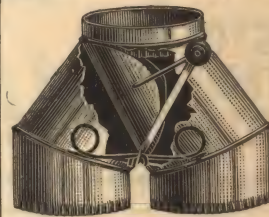


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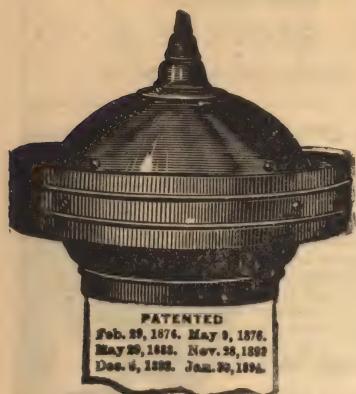
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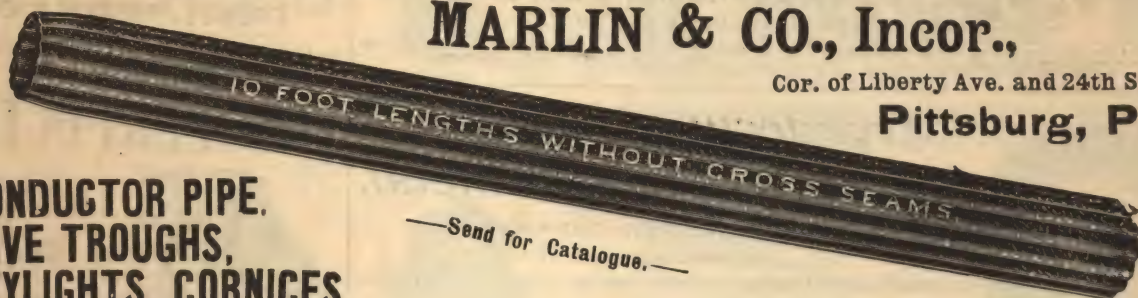
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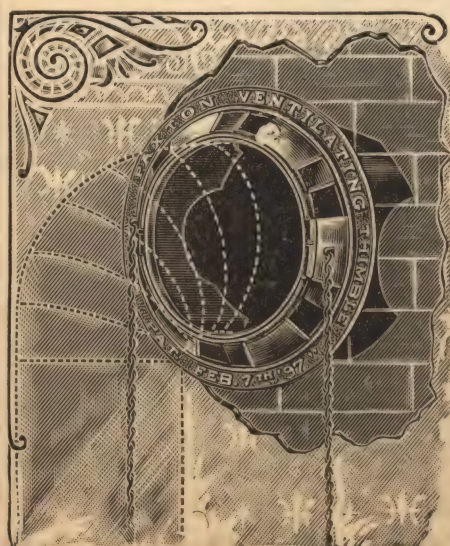
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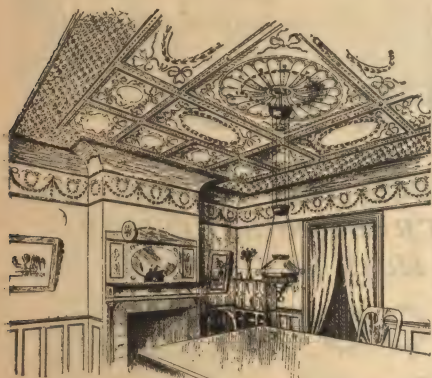
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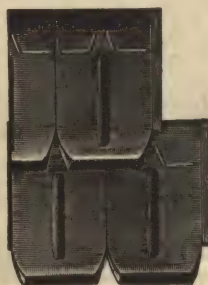
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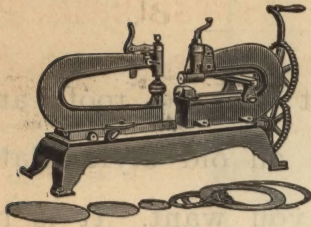


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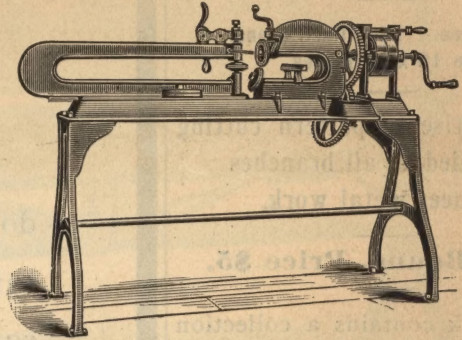
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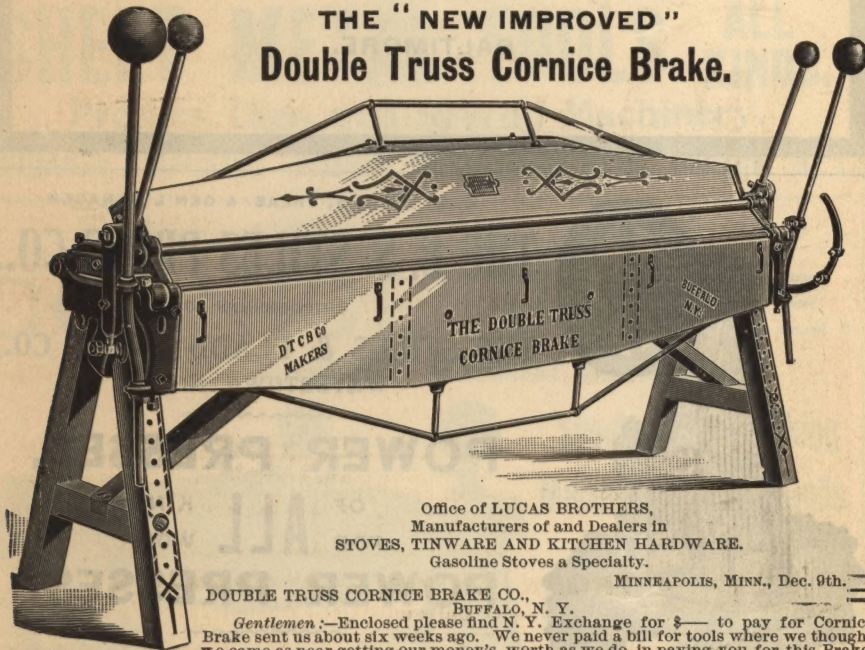
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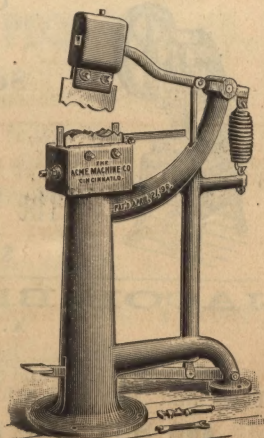
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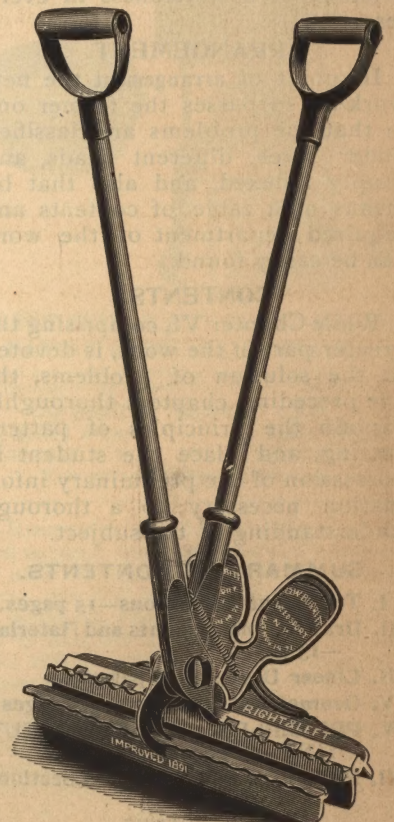


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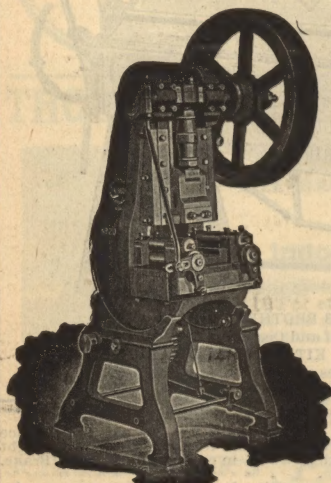
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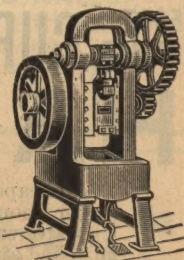
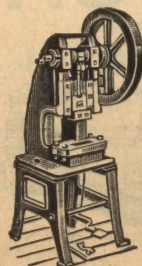
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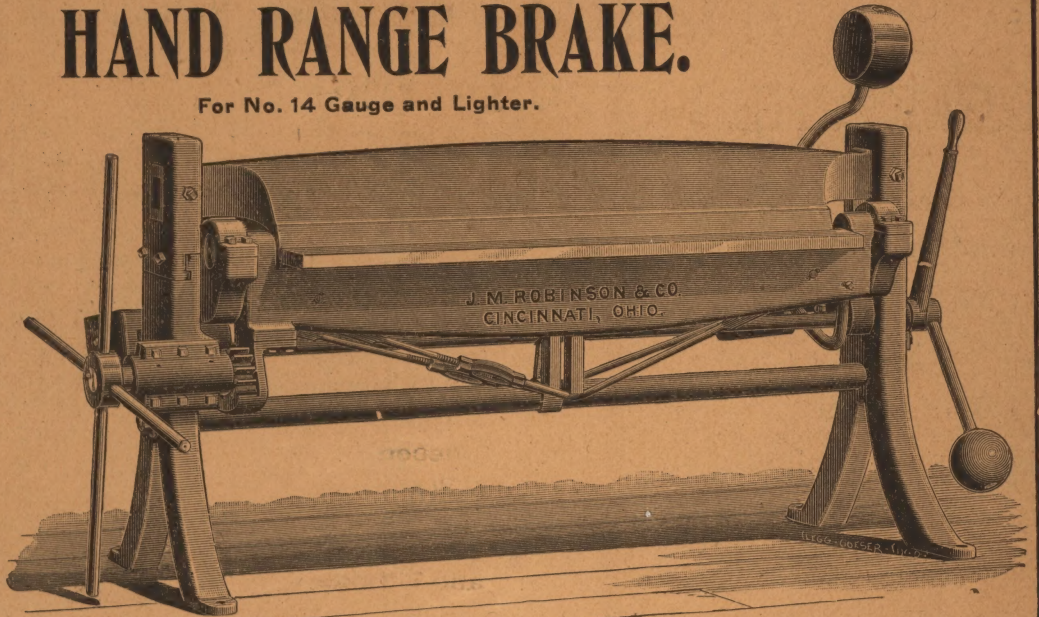
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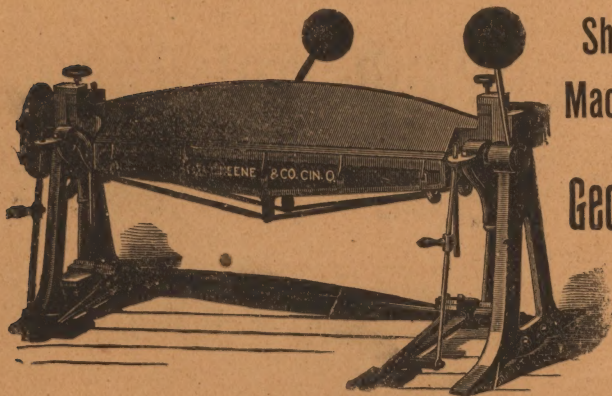
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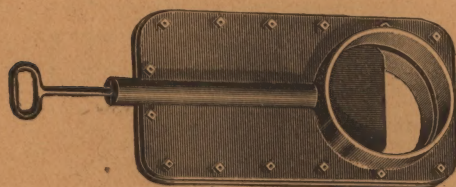
"Well," replied John, confidently, "I am your principal help here. I know every detail of the business, and, indeed, I think that you could not get along without me."

"Is dot so? Vy, Shon, vat vould I do suppose you vas to die?"

"Well, I suppose that you would have to get along without me then."

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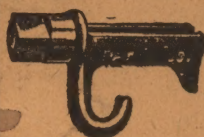
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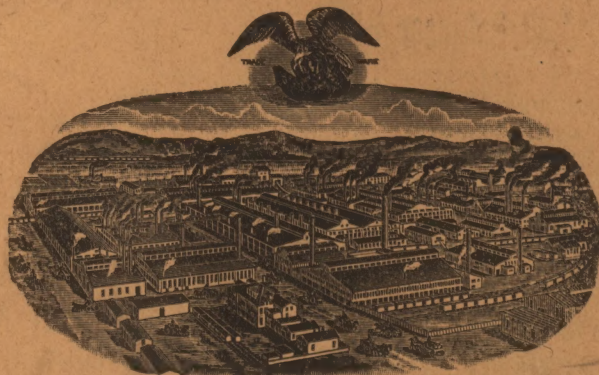
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